BATTLESHIP TEXAS (BB-35)

VESSEL INSPECTION AND ASSESSMENT

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Vessel Survey Report No. 2417

Vessel surveyed at:	La Porte, Texas
Dates of survey:	November - December 2010 January 2011
Vessel surveyed:	Battleship TEXAS (BB-35)
Survey commissioned by:	Texas Parks & Wildlife Battleship TEXAS State Historic Site 3523 Independence Parkway South La Porte, Texas 77571
Purpose of survey:	Vessel Condition Survey

Crew mustered on foredeck of Battleship TEXAS for concert (Thomas Clark Image No. 40, TPWD Collection)

Table of Contents

List of Figures

List of Tables

EXECUTIVE SUMMARY

The Battleship TEXAS (BB - 35) is a signature vessel in the annals of the U.S. Navy with historic significance nationally as well as internationally. As a national monument, the real work has been, and will always have to be, to ensure that the vessel is correctly preserved and displayed. This process will be, of necessity, an evolutionary one as new preservation technologies are developed and tested, proven good or discarded. The vessel's age, size and mass dictate a need for continuous and creative maintenance procedures.

This report presents an assessment of the present condition of the vessel as obtained from a thorough and detailed inspection carried out from November, 2010 – January, 2011. Critical problem areas have been identified as those that merit immediate consideration before the re-floating of the vessel through dredging and the towing of the vessel to its temporary or final berthing configuration. Unless these issues are addressed satisfactorily before the vessel is re-floated or towed, there is significant risk in causing irreparable damage to the vessel. Other problem areas that have been identified primarily focus on the ongoing structural and cosmetic deterioration of the vessel, including the associated safety and environmental hazards, and which need to be addressed to extend the life of the vessel once it has been dry-berthed. This report should be read in conjunction with Lombardi (2010) and Possehl (2010) which document the Ultrasonic Testing (UT) and corrosion analysis results from a diving survey and the stability assessment of the vessel, respectively.

The critical problem areas observed during the inspection, highlighted in Figure 1, are as follows:

1. **Outboard Blister Tanks (Section 5.1; Figure 68, Figure 69, Figure 70).**

   The outboard blister tanks were inspected and ultrasonic testing (UT) readings were taken of the shell plating on both sides of the vessel (Lombardi, 2010). The UT results showed severely wasted or holed plating throughout the length of the vessel on both Port and Starboard sides. Tugs cannot rest against the majority of the blister tank system on either Port and Starboard sides. Several tanks on the starboard side were inspected by an ISHOT 550 HD camera and the interior structural support members for the shell plating were either severely deteriorated or non-existent, and have separated from the armor belt above and shell plating below. This is cause for serious concern as no confidence can be placed upon the blister tanks or related structural members to support the ship during an intermediate docking interval with regard to a normal pierside fendering system (Possehl, 2010). Serious consideration must be given to the repair of the blister tank plating and scantlings before the vessel is re-floated, towed or moved into a dry-berth. This type of repair can be achieved before any dredging to re-float the vessel. Detailed repair recommendations are provided within the main body of the report.

2. **Hold and Inner Bottom Tanks (Section 14, Section 15; Figure 361 – Figure 402)**

   The vessel is aground from Frame No. 10 to approximately Frame No. 129 and is freely flooding in many areas. A portion of the vessel's void, fuel and water tanks were also inspected. The lower 8 ft of inner bottom and hold are in an extremely deteriorated material condition and need to be rebuilt. Much of the interior scantlings have greater than 60 - 80% loss and are failing due to heavy weight loads (boilers, main engines, etc.). There is no transverse watertight integrity of the main bulkheads. The interior spaces forward of Frame No. 63 are generally in reasonable condition. The structural frames, bulkheads and foundations for the hold and inner bottom tanks aft of Frame No. 65 to the Stern are badly degraded. Aft of Frame No. 64 to Frame No. 135, all interior tanks contiguous to the centerline keel showed heavy to severe wastage, if not outright failure, in that the keel, longitudinal and transverse frames

and watertight bulkheads are severely scaled with standing water and there is generally severe rust/scale present (Section 15.2 – Section 15.4). The vessel's fuel tank steam heating coils and many valve manifolds are badly wasted/deteriorated and have failed in many areas. The rivet seams show severe wastage/failure as to plate lap seams and docking keel appendages. The Aft Emergency Diesel Room (Section 14.2.7.9) is in poor material condition and unsafe for personnel entry. Repairs to these deteriorated structural components should be undertaken with the vessel in its current slip and prior to any re-floating or towing. Detailed repair recommendations are provided within the main body of the report.

2a Boiler Rooms B-3 and B-4 (Section 13.2.2 and Section 13.2.3, Figure 313, Figure 314, Figure 317, Figure 318)

The foundations for the boilers within the boiler rooms are starting to fail with signs of badly scaled or compressed plating and foundations. The floor for these boilers is completely wasted through in many areas allowing views within the underlying hold tankage with approximately additional 40 – 70 % wastage in places. The underlying support frames and longitudinals within the tankage in the hold and inner bottom is severely bent, totally wasted away or non-existent and showing ready signs of eventual collapse. The side shell on both sides appears fine with no leakage from outboard tankage, piping or manifolds.

2b Aft Trim Tanks D-12 and D-13 (Section 15.4.1, Section 15.4.2, Figure 392, Figure 393, Figure 397)

This space is just below the steering room and originally supported the decks, stanchions and foundations above. This space was reportedly (according to TPWD staff) flooded for decades with salt water and has now deteriorated throughout to a dangerous degree. The tank shell plating exhibits greater than 80% loss with heavy leakage noted on the forward starboard side at the wind/waterline and to port opposite. An automatic pump is fitted to regularly dewater this space. There is heavy rust/scale throughout the compartment. Longitudinal Frames show greater than 80 % plate loss with heavy scale mostly in all portions of the space. There are badly tripped and distorted transverse frames throughout the space. The keel has greater than 80% plate loss and there is 12 inch of standing water from weeping rivets and bottom plating. The shell plating below the waterline in the Aft Trim Tanks D-12 & D-13 are continuously leaking, requiring a float-type bilge pump to be engaged at all time.

3. Engine Rooms (Section 14.2.7, Section 14.2.7.1, Section 14.2.7.2, Section 15.3.1; Figure 350- Figure 352)

The main engine foundations (particularly the port side unit) have failed and are a serious structural and safety concern. The six tanks under the pair of main engines are freely flooding. Tank C-95 is flooded with 3 ft + of standing water and 3-4 in of oil and could not be inspected. Of concern is the foundation for this engine in that the weight of this structure depends upon the strength of the three underlying inner bottom tank scantlings. There is very little material left within the scantlings below (engine room floor, transverse frames, longitudinal frames, keel) the main engine. The engine's base foundation has also been impacted by corrosion. Other major components, foundations and platforms in this space are in acceptable condition but all suffer from a lack of support from the inner bottom tanks. The Fore and Aft bulkheads are holed due to corrosion. It is recommended that repairs to these tank and engine bed scantlings and bulkheads be performed before the vessel is towed. This type of repair can be achieved before dry-berthing.

4. **Chief Petty Officer (CPO) Spaces (Section 11.1, Section 11.2 and Section 11.3; Figure 250 - Figure 256)**

   There is severe deterioration Aft of Frame No. 120 up to the Third Deck. The tankage, trim tanks and upper deck main supports (vertical main stanchions, from shell plating/keel up to the bottom of the Second Deck), which includes the CPO spaces on Half Deck after Frame No. 115 have failed, or are soon to fail. The bulkheads, transverse web frames, floors and keel are in poor material condition and in jeopardy of failure. The vertical support stanchions in the CPO Quarters supporting the Second Deck are severely corroded with wasted pedestal bases. The deck itself is severely wasted and unsafe in many areas. The side shell tanks are entirely wasted away. The transverse bulkheads are non-watertight and are holed. Tugs cannot rest against the stern plating on either the Port or Starboard sides, nor can they exert any pull on the stern/main-deck cleats, bollards and chocks. These must be rebuilt prior to any movement of the vessel. Detailed repair recommendations are provided within the main body of the report.

5. **Steering Gear, Steering Room and Overhead Void Spaces (Section 13.3.13, Section 13.3.16, Section 13.3.17; Figure 329, Figure 332 - Figure 335)**

   The steering room spaces contain the main electrical and hydraulic control equipment powering the steering rams in the next space aft. An antique quad of wooden steering wheels are fitted, but are no longer attached to the steering assembly linkage. This space also contains the extremely heavy pair of hydraulic rams connected to the rudder post that steers the ship; these are very robust and locked in position to a 15 degree starboard turn.

   The condition of the space is poor structurally and poor cosmetically. The deck is wasted and holed, and inspection by gauging showed wastage greater than 60-70% over a wide area. Transverse web frames have failed entirely. The overhead sheathing, support framing, bulkheads and vertical stanchions supporting the turtleback on the overhead sheathing have failed, or are soon to fail, due to corrosion. The deck itself is poorly supported by the transverse frames and stanchions within the Trimming Tank D-12. This entire area needs to be rebuilt to withstand the movement of the ship and to impart any strength while on the keel blocks to support everything under the Third Deck. Detailed repair recommendations are provided within the main body of the report.

6. **Asbestos, PolyChlorinated Biphenyls (PCB), Lead Paint and Other Contaminants**

   Considering the age and vintage of this ship, it can be assumed that asbestos, PCBs, and lead paint will be found on the ship. While extensive asbestos remediation was completed and documented as per Texas Parks and Wildlife (TPWD), any future maintenance and/or repairs done to the ship should factor in the possibility of friable asbestos being present either at the onset of the activities or as a possible consequence. A similar assumption can be made in reference to lead paint throughout the ship. PCBs prove more complex as the construction period and first half of the ship's life were PCB-free, it was only about 1929 that PCBs would have had the potential of occurring associated with new electrical installations. A more detailed investigation and testing regime might be necessary to determine potential PCB contamination within the ship. Any future ship repair work should include testing and determination of potential contaminants in the area of work.

The vessel's topsides above main deck are generally in good repair. The problems associated with the vessel's exterior include poor or non-existent drainage, failed paint system, rust and scale on exposed structure and the wooden deck. This is not considered a serious problem at this juncture, and will not

require repairs before the vessel is towed to its dry-berth, but will likely become a more serious issue in the future. The main problem areas observed during the inspection are as follows:

7. **Topside Hamper (Section 4)**

   The vessel's topside hamper above the main deck suffers from too much standing water and drainage issues. In particular, the armored citadel decks and both masts suffer from long term neglect as to poor steel plate replacement installation and failed paint coatings with the result that serious corrosion issues are now present (e.g. Figure 16). These conditions are found throughout the vessel's topside hamper. Plates and seams have opened up allowing water to penetrate the lower decks causing rust/scale corrosion. This is exacerbated, in some cases, by blocked drains, broken/missing drain piping and areas that have no drains where standing water accumulates (e.g. Figure 25). Detailed repair recommendations are provided within the main body of the report.

8. **Paint Coating System**

   The continued utilization of silicon alkyd paint on the vessel's topsides will incur a severe maintenance penalty due to the fact that this type of paint system will require re-coatings every other year or so. The use of a modern coating system (such as one provided within APPENDIX C (Coating System Specifications of this report) will greatly improve retention of sub-surface steel structure and greatly decrease maintenance costs. Detailed repair recommendations are provided within the main body of the report.

9. **Main and Upper Level Wooden Decks (Section 4.11, Section 4.12)**

   The vessel's wooden deck system on main deck and other upper level decks are in need of continued repair and maintenance as the welded steel attachment studs (of threaded mild steel) are starting to rust away and deteriorate the planking, seam/bedding caulking and steel deck. The caulking within the seam between both planks has pulled away in many areas of the deck . This has become problematic now as more water migrates to the area between wooden and steel deck. There is no easy fix to this problem (short of an entire deck replacement) and continuous repairs are ongoing to address this problem. Detailed repair recommendations are provided within the main body of the report.

10. **Pest Control**

    The effects of animals (including reportedly, raccoons) aboard the ship are evident. The effects of guano from pigeons and other birds and animals are already causing wastage of paint systems and resultant rust/scale of steel structure. The repair and placement of screens in gun barrels, overboard discharges and other favorite nesting areas, and other pest control strategies aboard should remedy the ongoing problem. Repair recommendations are provided within the main body of the report.

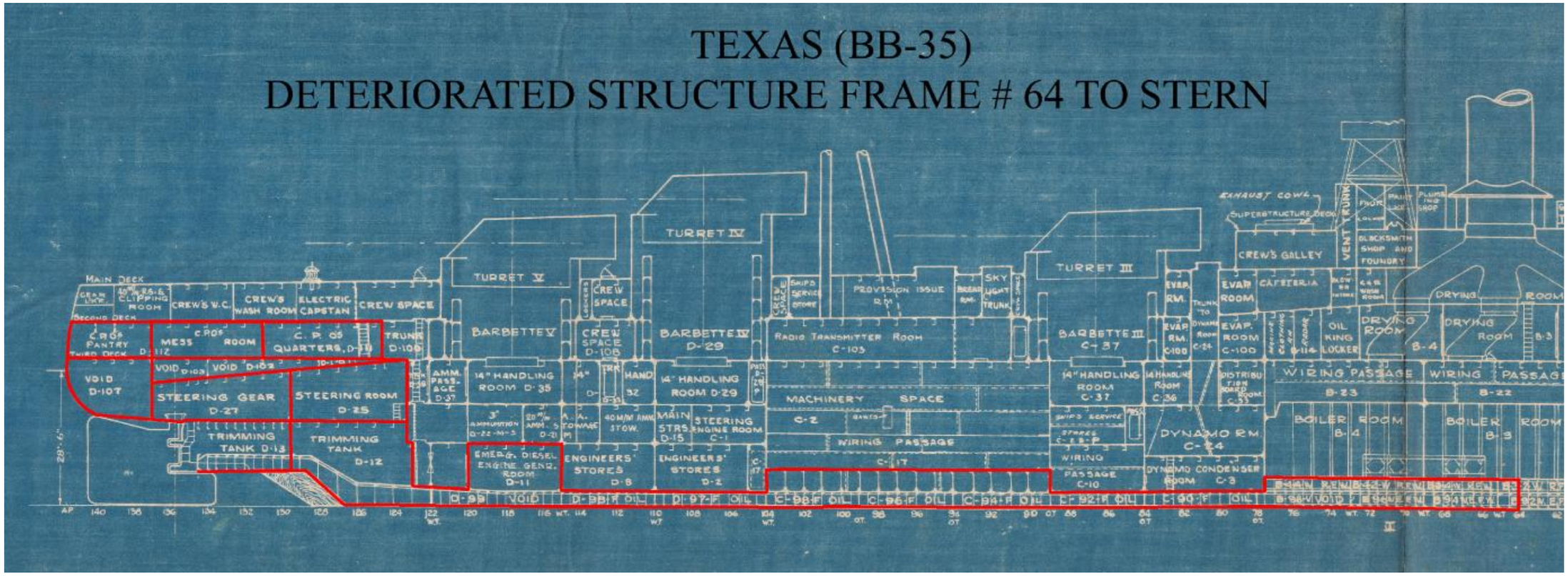

Figure 1 Structurally Deficient and Critical Areas of Vessel (Demarcated Within Red Lines)

1 INTRODUCTION

A structural survey of the Battleship TEXAS was conducted (Nov, 2010 – Jan, 2011) where she lay (aground within the slip bottom; afloat only on high water events) at the San Jacinto State Battleground Park within her side slip/berth in the Houston Ship Channel. A vessel history has been provided in APPENDIX A (Vessel History).

The purpose of this walk-through survey was to ascertain the true condition of the vessel and her ability to be moved and towed from her berth several years hence, out of her existing berth to a temporary berth site or to remain in her present setting whilst the new dry berth is constructed.

The surveyor was tasked with identifying issues of structure, internal tankage and the present/future issues facing the ship from a material condition perspective. The surveyor was also tasked with recommending general alterations or improvements needed on this battleship to safely move and dry-berth this vessel. She presents a very clean and neat cosmetic appearance where the public has access. The vessel is aground in the mud in her berth from Frame No. 10 aft to vicinity of Frame No. 129; the rise and fall of the tide is plus/minus 1foot. In a normal tide cycle the ship never comes off her mud berth.

This walk-through survey, performed at the request of the Texas Parks & Wildlife Department entailed a walk-through visual inspection of the overall physical condition and appearance of the vessel, with focus on its structural integrity, firefighting capability, de-watering systems, and conditions that could lead to serious injury.

Inspections of the outboard blister tank appendages were not a part of this survey, nor were the balance of tankage outside of the tanks mentioned within the contract language. Several blister tanks were inspected to get a ‘feeling’ for the condition of the ship.

The ship’s staff assisted greatly in this task of opening tank covers and hatches where they could safely enter spaces. Spaces not inspected are not noted within this report. Entry into fuel and/or ballast tanks was subject to air quality requirements under 29 CFR (Code of Federal Regulations) requirements and this was done with inspections carried out by a Marine Chemist. Where tank inspections were not possible, visual inspections from tank manhole covers was accomplished with photographs being taken by ISHOT 550 HD camera. The underwater appendage was not observed.

The reporting of the survey findings commences with the topside areas, followed by a deck-by-deck inspection of all interior spaces that were accessible at the time of survey. Tankage inspection assessments are provided at the end.

The inspection of this vessel started from top to bottom , forward to aft, and shall be described following that same course here in the narrative. Comments, observations and recommendations from the surveyor are in highlighted **bold** format. Observations and corresponding recommendations for dangerous and critical conditions are made in highlighted **bold and red font** format**.**

The CFR, American Boat & Yacht Council (ABYC), International Marine Organization (IMO), National Fire Protection Association (NFPA), and the Society of Naval Architects and Marine Engineers (SNAME) were utilized in compiling this report. Individual reference to subchapters of the above is not made within the body of this report. Other sources include the 'U.S. Navy Towing Manual', 'Manual on Ship Construction’, George C. Manning: Van Nostrand Co., and 'Standards For Steel Hulled Vessels', American Bureau of Shipping, 'Stability and Trim for the Ship's Officer' by William E. George, Cornell Maritime Press and 'Ship Design and Construction' by the Society

of Naval Architects and Marine Engineers.

2 VESSEL DATA

Table 1 General Dimensions of Battleship TEXAS

Vessel Parameter	Dimensions
Length Overall	573 ft
Length WL Normal Designed	565 ft
Length WL Actual	565 ft, 7 1/4 in
Length Between Perpendiculars	565 ft, 6 1/16 in
Extension Beyond Forward Perpendicular	8 ft, 3/4 in
Extension Beyond Aft Perpendicular	0
Breadth (Extreme to Outside of Armor)	106 ft, 3/4 in
Frame Spacing	4 ft (Centers)
Number of Frames Between Perpendiculars	141
Draft (Forward)	22 ft, 10 in *
Draft (Aft)	26 ft, 1 in *
Displacement (Light Ship Condition)	25,119 Long Tons
Bottom of Keel to Molded Base Line	1 ft, 5/8 in
Draft to Designer's Water Line	28 ft, 6 in
Tons Per Inch Immersion	91.7 Long Tons
Wetted Surface to Normal LWL	65,700 Sq Ft
Ratio of Length to Beam	5.934
* Drafts obtained from Ship Hull Characteristics Program (SHCP) computations performed by Jerry Posshel for Intact Stability.	
Note : As per TPWD, since 3/1/2005, Forward and Aft Drafts have consistently been observed to be 22 ft, 9 in and 27 ft, respectively.	

3 GENERAL ARRANGEMENT & HULL STRUCTURE

One really becomes aware of the incredible size, power and majesty of this vessel as you row a boat around her waterline; simply an incredible achievement in engineering and construction that few countries could ever hope to match, much less duplicate or exceed in her time.

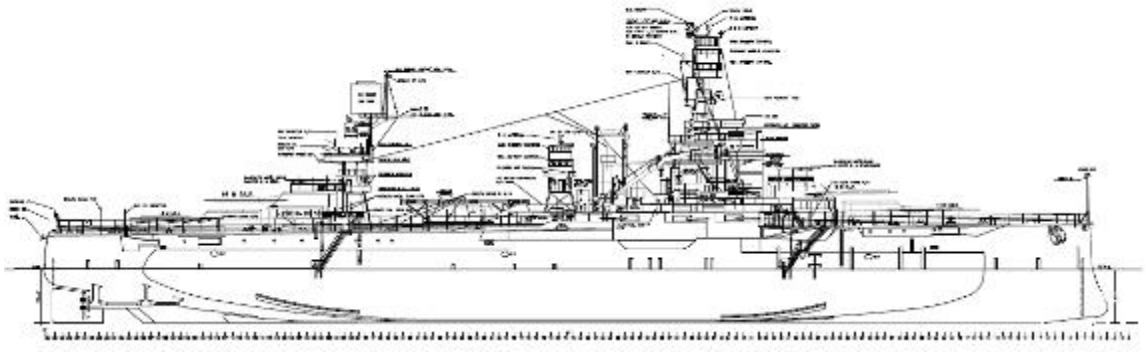

Figure 2 Outboard Profile of Battleship TEXAS

The exterior view of the battleship presents a very low silhouette forward and aft with a reverse blunt stem followed by an increasingly wide forefoot (necessary to accommodate the forward pair of 14-inch turrets and magazines) with a very high topside hamper and superstructure amidships. Her stern is relatively low and squat with a large area occupied by the pair of 14 inch turrets (Figure 2).

Beam was limited to 108 ft due to considerations of passage through the Panama Canal. She is somewhat stiff in her stability (meaning that she tended to snap back to her upright condition when rolling in a seaway) in that modifications/additions to her beam in the form of a pair of blister tanks were fitted from Frames No. 15 to 126 (Figure 3), the cage masts were removed for a pair of tripod masts, conversion from coal to oil fired boilers and the elimination of B-1 Boiler Room, and the changes in armament and electronics were factored into the ship for the changing tide of technology in ships of this class after their commissioning. Overloading was a central theme and a concern during her lifetime with the fleet.

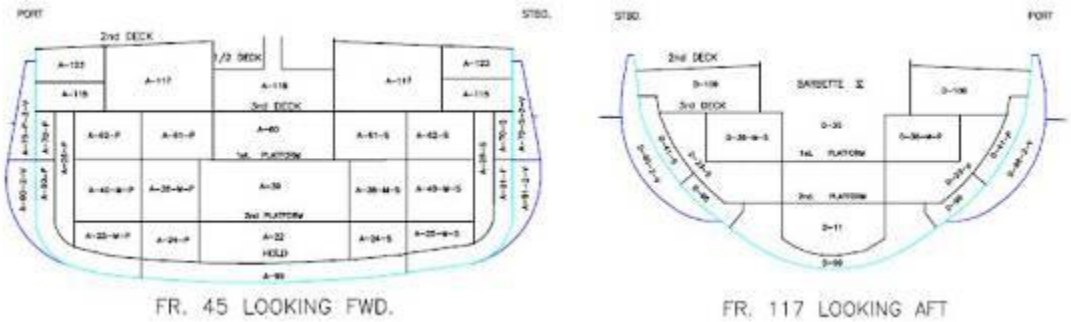

Figure 3 Representative Body Plan Sections Showing Blister Tankage (in deep blue)

This ship was designed as a flush-decked unit with a short, wide hull, allowing a 21 knot hull speed deemed important by her designers. The hull has a reverse stem with a very high bow with the amidships section of the hull having a full underbody shape with mild tumblehome amidships,

which gradually tapers aft of the engine rooms to moderately round chines at the turn of the bilges with a large, single rudder aft. Blister tankage was added in the 1925-1926 overhaul to increase stability.

The hull is built in general of medium steel, high tensile steel being used for all main deck plating outside the line of barbettes between Frames No. 53 and 91, for the main deck stringer angle and waterway angle for the same extent and for this sheer strake between Frames No. 46 and 91. Special treatment steel is used for the stringer on the underside of main deck means, for portions of longitudinal and transverse bulkheads and platform plating in way of ammunition stowage and for upper course of protective deck plating; for splinter bulkheads between gun and main deck's, port sill plates, bullet shields, turret shell plates and conning tower baseplate. The lower course of protective deck plating throughout is of 20 pound medium steel.

The upper course is of special treatment steel of the following thicknesses:

- From Stem to Frame No. 18 - 40 pound
- From Frame No. 18 to Frame No. 47 - 60 pound
- From Frame No. 47 to Frame No. 77 ½ - 40 pound
- From Frame No. 77 1/2 to Frame No. 122 - 60 pound
- From Frame No. 122 to Stern - 100 pound

The deck is flat at the upper platform level from the Stern to Frame No. 18, flat at the berth deck level from Frame No. 18 to the Frame No. 122, and slopes down both aft and outward from Frame 122 to the Stern.

3.1 ARMOR

3.1.1 MAIN BELT ARMOR

The main belt side armor extends from Frame No. 18 to Frame No. 137. From Frame No. 18 to Frame No. 122, armor is 12 inches thick at the top and 10 inches thick at the bottom with uniform taper. Between Frames No. 122 and No. 137 armor is 6 inches thick. The width of the main belt of armor is 7 foot 11 1/2 inches throughout, the top being 23 1/2 inches above the designed normal load waterline. The main belt athwartships armor at Frame 18 is 10 inches thick throughout from the protected to the half deck, except outboard at the chain lockers, port and starboard between the protected and berth decks which is 11 inches thick. The main belt athwartships armor at Frame No. 137 extends from the Stern post casting to the top of the berth deck and is 9 inches thick throughout.

3.1.2 CASEMATE ARMOR

The lower casemate side armor extends from Frame No. 18 to Frame No. 122. Between Frames No. 47 1/2 and 78 1/2, it extends vertically from the top of the main belt armor to the 5 inch gun port cells and is 11 inches thick at the bottom with the uniform taper to 9 inches thick and at a point 9 foot above the bottom, the taper continuing in a straight line from this point to the top of the plates. This portion of the casemate is worked in vertical plates about 8 feet wide, the bus butts coming on alternate frames from Frames No. 50 to Frame No. 76 both inclusive. The forward section of the casemate extends from Frame No. 18 to the forward side of the forward diagonal armor bulkhead. It extends to the top of a half deck stringer at Frame 18 and is kept level at that height throughout its length. It is 11 inches thick at the bottom with the uniform taper to 9 inches thick at the top. The after section of this casemate extends from the after side of the after diagonal armor bulkhead to Frame No. 122 and vertically from the top of main belt armor to the upper side of the gun deck stringer plate. It is 11 inches thick at the bottom with the uniform taper 29 inches thick at the top.

The upper casemate side armor extends from the forward side of the forward diagonal armor bulkhead to

the after side of the after diagonal armor bulkhead and vertically from the top of the lower casemate armor to the lower side of the upper sill plate of the 5 inch gun ports. It is 6 1/2 inches thick throughout.

The lower casemate athwartships armor at Frame No. 122 extends from the top of protective deck to the lower side of gun deck plating and is 10 inches thick throughout. The triangular portion over the slope of the protected deck and below the berth deck is 7 inches thick, for both port and starboard sides of this area.

The forward upper and lower casemate diagonal armor extends from the Turret No.2 to the forward end of upper casemate side armor and vertically from the half deck to the underside of the main deck. From deck to the gun deck is 9 inches thick throughout, and from the gun deck to the main deck is 6 1/2 inches thick throughout

The after upper casemate diagonal armor extends from Barbette No.3 to the after end of upper casemate side armor and vertically from the gun deck to the underside of main deck plating. It is 9 inches thick at the bottom uniformly tapered to 6 1/2 inches thick at the top.

3.1.3 BARBETTE ARMOR

Barbette No. 1 armor is 5 inches thick between the protected deck and half deck excepting for 19° each side of the centerline of the ship on the after side, which is 4 inches thick. From the half deck to the top of barbette is 12 inches deck except for 51° each side of the centerline of the ship on the after side. Between the angles of 51° and 19° each side of the centerline of the ship it is tapered uniformly from 12 inches thick to 10 inches deck, the remainder being 10 inches.

Barbette No. 2 armor is 5 inches thick between the protected deck and half deck excepting for 19° each side of the centerline of the ship on the forward side, which is 4 inches thick. Between a half deck and a gun deck it is 5 inches thick abaft the diagonal armor bulkheads port and starboard. Between the gun and main decks is 7 inches thick abaft the diagonal armor bulkheads port and starboard. The remainder of the barbette is 12 inches deck from the diagonal armor bulkheads port and starboard to an angle of 51° each side of the centerline of the ship on the forward side. Between the angles of 51° and 19° each side of the centerline of the ship is uniformly tapered from 12 inches thick to 10 inches thick, the remainder being 10 inches thick.

Barbette No. 3 armor between the protected and gun decks is 5 inches thick throughout. The remainder is 12 inches except forward of the diagonal armor bulkheads port and starboard between the gun and main decks when it is 7 inches thick.

Barbette No. 4 armor between the protective and gun decks is 5 inches thick excepting for 19° each side of the centerline of the ship on the after side. The remainder is 12 inches thick excepting for 51° each side of the centerline of the ship on the after side. Between the angles of 51° in 19° each side of the centerline of the ship is uniformly tapered from 12 inches thick to 10 inches thick. The remainder is 10 inches thick.

Barbette No. 5 armor is of the same thickness as Barbette No. 4 excepting that the tapered and thin segments are on the forward side.

3.1.4 TURRET ARMOR

The port and starboard plates for all turrets (Figure 4) are 14 inches thick, the front side plates 9 inches thick, the rear side plates 8 inches thick and the rear vertical plates 8 inches thick. The roof plates are 4 inches thick.

Figure 4 No. 1 and No. 2 14 in Caliber Turrets

The support structure for the five main turrets was inspected at time of the onboard survey. The basic observation is that all five turrets are well supported and are locked in train and elevation at this time. There is more than adequate structural integrity for the support of these weapons.

3.1.5 CONNING TOWER AND TUBE ARMOR

Conning tower armor is 12 inches thick throughout. The tube is 11 inches thick throughout, the top plate is 8 inches thick in two courses and base plate 3 inches thick. The central armor is 6 inches thick on the forward side and port and starboard sides. The fire control enclosure within the conning tower is 2 inches thick.

3.2 DOCKING KEELS

The docking keels (Figure 5 and Figure 6) are made in three sections on either side of the ship fitted with teak 18 inches wide. Between Frames No. 22 and 37 the centerline of the keels is 9 feet 1 1/2 inches each side of the centerline of the ship. Between Frames No. 35 and 105 the centerline of keels is 24 feet 4 1/2 inches each side of the centerline of the ship. Between Frames 103 and 118 the centerline of keels is 9 foot 1 1/2 inches each side of the centerline of the ship. Between Frames No. 52 and 86, the keels are built of 20 pound flange plate with teak filling. Forward and aft of these points, the middle sections of the keels, and the length of the forward and after sections of the keels are built of plates and angles with the teak shoe covered with 5 pound plate. The bottoms of all keels are level with bottom of flat keel plate.

Figure 5 Docking Keels During Last Dry-dock in Galveston. Note Rolling Chocks Fitted at Turn of Bilge to the Blister Tank at Left

Figure 6 Port Side at Time of Last Dry-Docking Showing the Keel, Docking Keels and Blister Tankage Bulge to Port.

3.3 BULKHEADS

Of all riveted construction, the TEXAS's graceful hull is a flush deck design incorporating both longitudinal and transverse framing. Watertight integrity is enhanced by 19 watertight bulkheads within the bottom tankage (at Frames No. 5, 14, 18, 21, 24, 31, 37, 41, 51, 56, 60 ½, 65, 69, 73, 104, 110, 115, 122 and 129).

Further protection is provided by 9 oil tight bulkheads within the bottom tankage (at Frames No. 31, 41, 47, 78, 84, 89, 94, 99, and 104).

3.4 BLISTER TANKAGE

The vessel was fitted with exterior blister tankage (Figure 7) at the time of the 1925-1926 overhaul; these were externally fastened to the vessel's armor protection belt and bottom plating between Frames No. 15 and 128. These tanks were not inspected (except for a pair of tanks on the aft side to starboard), but borne out to be seriously degraded from the sampling of conditions noted within the pair of tanks inspected.

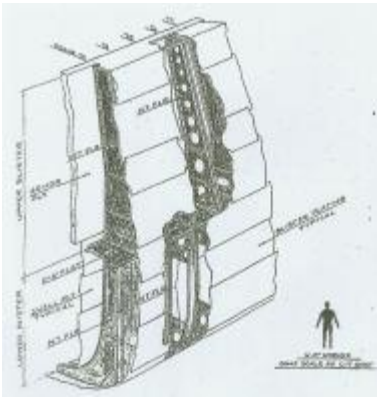

Figure 7 Isometric Drawing of External Blister Tankage (Sheet No. 1, Inner Bottom Tank Soundings 5-2009; TPWD Project No. 101901, 2009)

The sectional view of the amidships section of Battleship TEXAS gives a feel for the external construction of this great vessel. The armor plating is shown hung (originally) externally, later covered by the upper section of the blister tankage to the left side of the drawing. The great bulge of the lower portion of the blister tankage can be seen at the lower left corner of the profile (Figure 8).

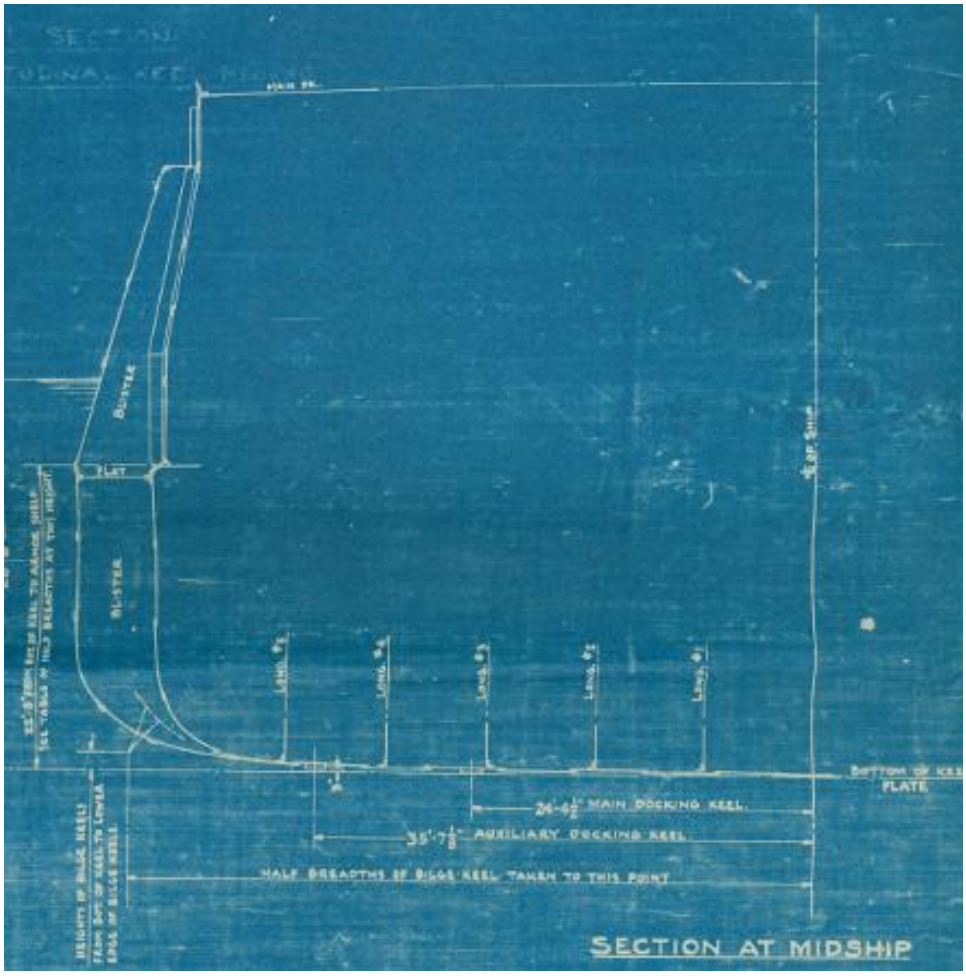

Figure 8 Blister Tankage at Midship Section

3.5 ROLLING CHOCKS

Rolling chocks (Figure 9 and Figure 10) are fitted to the vessel's shell plating (blister tankage) to mitigate the effects of rolling in a seaway. Presently they are buried in the mud and were not viewed at time of survey.

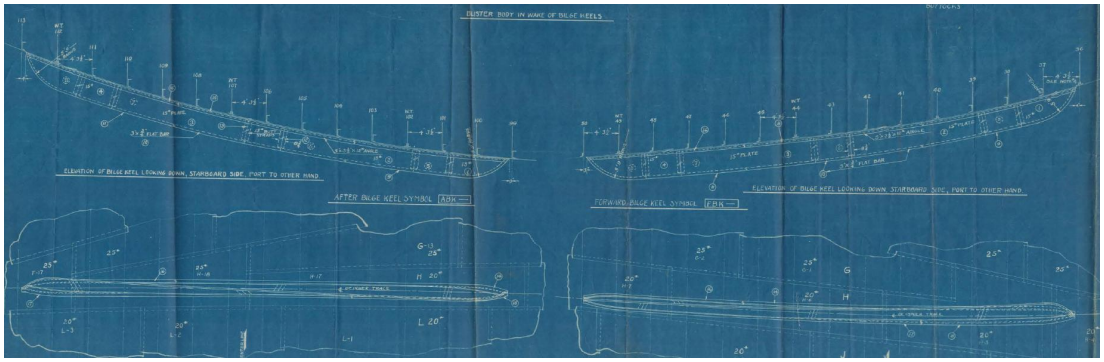

Figure 9 Rolling Chocks Fitted to Vessel

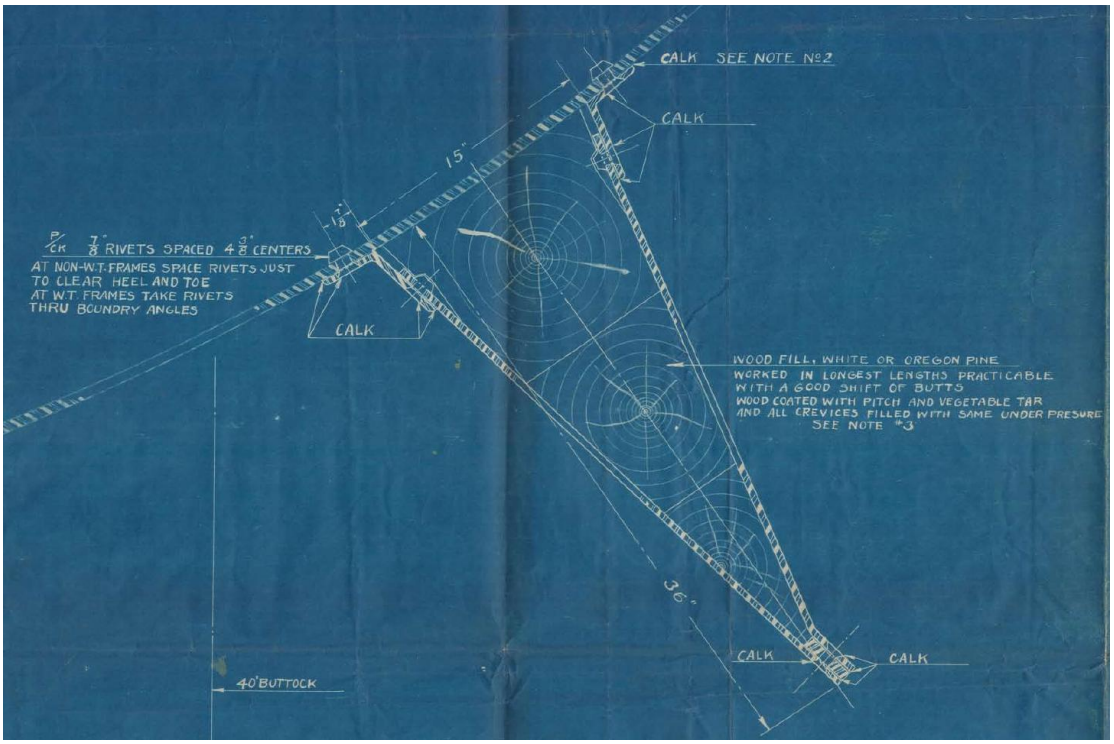

Figure 10 Cross-section of Rolling Chock

4 TOPSIDE HAMPER & WEATHERDECKS

4.1 TRIPOD FOREMAST

The tripod foremast (Figure 11) is fitted to the forward armored citadel and comprises the radar scanners, main and secondary battery control, forward battle lookouts/air defense and signal flag hoist yardarms. This large appendage is accessed via external ladders fitted to the legs of the tripod or through climbing an armored tube from the citadel to the platform.

Figure 11 Tripod Foremast

Figure 12 Heavy Rust/Scale and Failing Rivets at Base of Structure

Figure 13 Rust/Scale on Structure Supporting Forward Lookout Station

The exterior of this structure is in need of repair in that the support scantlings have water draining onto them from leaks within the Lookout Station (Figure 12 and Figure 13). There is a broken window in the structure allowing an owl to live there with the attendant debris field (Figure 14). The interior of the lookout station is badly scaled and is in need of restoration. The tripod legs appear to be in good repair with the usual rust/scale at the various platforms and support structure (Figure 15 and Figure 16); there is no sagging visible and the structure below decks appears to be in fine shape and well supported.

Figure 14 Interior of Lookout Station Showing Rust/Scale and Collapsing Floor (This Space Has Seriously Deteriorated Since Inspection in 2006)

Figure 15 Heavy Rust/Scale and Structure Failure on Base of Forward Lookout Station

Figure 16 Heavy Rust/Scale and Structural Failure on Base of Forward Lookout Station

Repair structural scantlings as needed on exterior base of lookout station.
Repair wasted deck in lookout enclosure.
Replace broken window(s) on interior of lookout enclosure.

4.2 FLAG BRIDGE

The deck on the Flag bridge is heavily wasted to starboard and aft on the public tour route (Figure 17, Figure 18 and Figure 19).

Figure 17 Flag Bridge Looking Aft to Starboard

Figure 18 Wasted Deck Plating at Riveted Seam on Public Access Route on Flag Bridge Level

Figure 19 Heavily Wasted Deck at Starboard Site Aft leg on Foremast Tripod at Flag Bridge Level

Prepare, prime and paint entire structure.
Replace all wasted deck plating and diagonal supports for the Flag bridge deck.

4.3 NAVIGATION BRIDGE

The deck plating and support structure on the Navigation Bridge are severely deteriorated (Figure 20 and Figure 21).

Figure 20 Navigation Bridge Exterior (Looking Forward to Starboard)

Figure 21 Wasted Plating on Overhead, Deck and Support Structure of Navigation Bridge

Repair wasted deck plating and support structure as this is a public access area.

Prepare, prime and paint entire structure.

4.4 SEARCHLIGHT PLATFORM

This space (Figure 22 and Figure 23) contains platforms and foundations for the pair of 36 in. searchlights. The bases of these lights are severely deteriorated. The area surrounding the searchlights and the lights themselves are suffering from rust/scale.

Figure 22 Deteriorated Base of Starboard Searchlight

Figure 23 Overhead of Searchlight Platform Showing Heavy Rust/Scale and Structural Failure

Repair wasted deck plating below searchlights and support structure as this is a public access area.

Repair wasted deck plating and structural members on overhead and support structure as this is a public access area.

Prepare, prime and paint entire structure.

4.5 SIGNAL BRIDGE

This raised platform contains the flag bags for the signal bridge and a single quad 40 MM mount outboard. There is rust/scale degradation to the space's railings that must be addressed as a safety issue being a public access space. The pair of quad 40MM mounts are suffering from heavy rust/scale (Figure 24, Figure 25 and Figure 26).

Figure 24 Wasted Handrail on Stanchion Base

Figure 25 Blocked Drainage and Wasted Stanchion Base on Signal Bridge

Figure 26 Wasted Diamond Plating on 40MM Gun Mount to Starboard

Repair handrail stanchions, renew stanchions and foundations throughout space.

Repair both 40MM mounts.

Prepare, prime and paint entire structure.

Free up drainage.

4.6 BOAT CRANE (PORT)

The boom is present, but the rigging and sheaves have been down-rigged (Figure 27). The crane base is in excellent structural condition and the foundation is in good repair. Some degradation of tie rods and connecting bolts is apparent, but not critical at this time. 20MM guns have been removed from top of crane. The structure is in good cosmetic condition. There is minor standing water and blocked drainage with resultant wastage of deck plating and crane base structure.

Figure 27 Boat Crane (Port)

Clear crane drainage of dirt/debris.

4.7 BOAT CRANE (STARBOARD)

The boom is present, but the rigging and sheaves have been down-rigged (Figure 28). The crane base is in excellent structural condition and the foundation is in good repair. Degradation of tie rods and connecting bolts is apparent and requires repair. 20MM guns have been removed from top of crane. The structure is in good cosmetic condition. There is minor standing water and blocked drainage with resultant wastage of deck plating and crane base structure.

Figure 28 Boat Crane (Starboard, Looking Aft)

Repair wasted tie rods, bolts and foundations.
Clear crane drainage of dirt/debris.

4.8 STACK

This structure (Figure 29) is in great cosmetic and good structural condition. Supporting standing shrouds, turnbuckles and mounting bases/foundations are in good material condition. Stack structure itself is in good repair with little degradation noted and is well painted.

Inspect and repair as necessary all shackles, mousing wires and seizings for shrouds on a systematic basis.
Consider uniform tightening of shrouds to a snug condition.

Figure 29 Stack

4.9 MAIN & SECONDARY BATTERY CONTROL

The outboard shell (Figure 30) is in good structural condition. Mounting bases/foundations on superstructure deck are in poor to fair material condition. External structure itself is in good repair with little degradation noted. The structure is in great cosmetic condition and is well painted. The internal structure main scantlings are in good repair, but heavy rust/scale is present on the upper and lower battery control decks with failed plating present.

Figure 30 Main and Secondary Battery Control Shell

Upper and lower decks for battery control stations badly corroded and is a safety hazard; repair and replace decks in these two areas.

Seal all areas for water intrusion as this has caused the majority of degradation to foundation structure.

Inspect and repair (as needed) main structural foundation.

4.10 MAINMAST

Located aft at Frame No. 98 – 101, this structure was fitted in the 1925-1926 overhaul and comprises the platforms for the antennas, radars and aft aircraft spotting (Figure 31 and Figure 32).

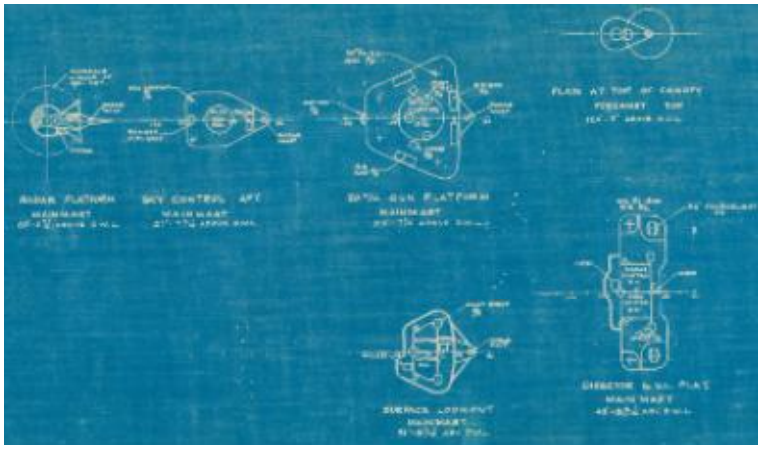

Figure 31 Layout of Main Mast

Figure 32 Main Mast

4.10.1 SPAR & ANTENNA SUPPORT STRUCTURE

This highest appendage (Figure 33) is in excellent structural condition; the large radar array was

replaced at time of last dry-docking. The cosmetic coating is starting to fail.

Figure 33 Spar and Antenna Support Structure

Prepare, prime and paint structure.

4.10.2 SKY CONTROL AFT PLATFORM

This structure (Figure 34) is in good structural condition with good drainage.

Figure 34 Sky Control Aft Platform

Prepare, prime and paint interior bulkheads and deck as needed.

4.10.3 20 MM CLIPPING ROOM GUN PLATFORM

This space (Figure 35) is in good structural condition with good drainage.

Figure 35 20 MM Clipping Room

Prepare, prime and paint interior bulkheads and deck as needed.

4.10.4 20 MM GUN PLATFORM

This structure (Figure 36) is in good structural condition with good drainage.

Figure 36 20 MM Gun Platform

Prepare, prime and paint interior bulkheads and deck as needed.

4.10.5 SURFACE LOOKOUT PLATFORM

This structure (Figure 37) is in good structural condition with good drainage.

Figure 37 Surface Lookout Platform

Prepare, prime and paint railings and deck as needed.

4.10.6 DIRECTOR & SEARCHLIGHT PLATFORM

This platform contains the pair of directors and two 36" searchlights (Figure 38 and Figure 39). Both pairs of directors and searchlights are in need of immediate repair/restoration as the effects of weather are rapidly deteriorating the base structural members and components of these units to a very sad state. Standing water is an issue with deteriorated deck and heavy rust/scale present. The pair of searchlights have name plates assigning them to ARIZONA (Figure 40) which make them certainly worthy of a complete restoration due to their significance.

Figure 38 Direct and Searchlight Platform

Figure 39 Starboard Searchlight (Left) and Detail of Degradation of Searchlight (Right)

Figure 40 Detail of Equipment Plate for Searchlight with "ARIZONA" on Faceplate

Free up drainage.
Prepare, prime and paint interior bulkheads and deck as needed.
Restore both searchlights and both directors.

4.11 SUPERSTRUCTURE DECK

This exterior deck (Figure 41) surrounds the armored citadel previously described. The deck area comprises support foundations for the six 3" 50 Cal. guns and the four 40 MM mounts. This area also encompasses the bases for the stack and the amidships battery control station. The 26' motor whale-boat rests in a cradle at the base of the starboard crane; this boat requires a full restoration.

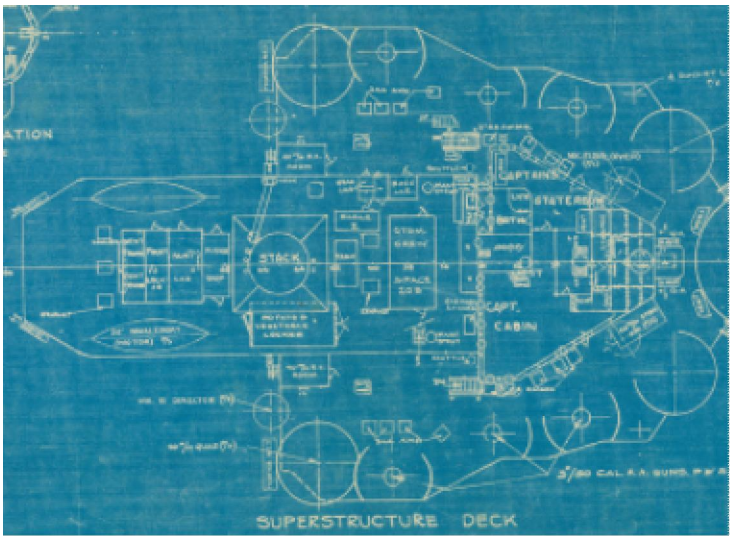

Figure 41 Superstructure Deck Layout

The exterior deck (Figure 42) is sheathed with what appears to be yellow pine (3 in. x various width) decking in need of repair due to ingress of water through the paid seams or through the various margin plates or gun mounts. The usual issues of drainage, wooden deck maintenance and cosmetics are the main concerns.

Figure 42 Wood Decking on Superstructure Deck

The 40 MM gun mounts (Figure 43, Figure 44 and Figure 45) are suffering from lack of maintenance and are corroding freely.

Figure 43 Superstructure Deck (Looking Forward to Starboard)

Figure 44 Superstructure Deck (Looking Aft to Starboard)

Figure 45 Sample of Rust/Scale Causing Widespread Degradation on the 40 MM Mounts

Repair wooden deck as needed to avoid trip/fall issue in future.

Repair, prep, prime and paint 40MM gun mounts

Consider canvas cover for these mounts.

Remove 3 in. 50 Cal. mounts, repair wood and steel decking beneath and re-attach.

4.12 MAIN DECK

4.12.1 SHIPBOARD MOORING APPURTENANCES AND APPENDAGES

The maindeck chocks and bitts were inspected at the time of survey with magnetic particle and KRAUTKRAMER-BRANSON flaw detection technology. The foundations for these pieces were also inspected. If a decision is made to moor the vessel by dock lines, each chock and set of double bitts will need to be repaired as there is extensive rust/scale present on all hardware. Flaw detection showed that castings, weldments and condition of rivets is poor/fair in all mooring appurtenances.

The deck towing eyes and their foundations, forward and aft, are in good structural condition. The starboard anchor is not properly housed (see Figure 46) in that the anchor has not been pulled into her stops in the hawse pipe.

Figure 46 Starboard Anchor Not Properly Housed

4.12.2 STEM TO TURRET No. 2

The main deck (Figure 47 and Figure 48) is the main public access area and is central to the mission of displaying the ship. This area of main deck contains the anchor gear/chain, pelican hooks, steam anchor windlass wildcats/warping capstans, and Turrets No. 1 & No. 2. The main deck has a wooden deck installed. Handrail stanchions with double lifelines are fitted around the perimeter of the deck. The forward towing eyes are installed on the centerline forward. Chocks and double bitts are fitted for securing the vessel. The usual problems of rust/scale and water under the wooden deck are found here.

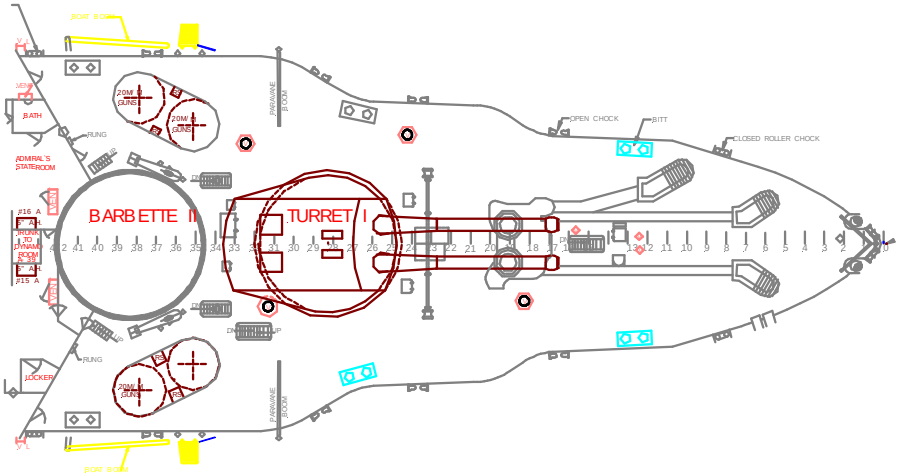

Figure 47 Main Deck (Stem to Turret No.2) Layout

Structurally, the main deck and its support scantlings are in good repair in this area and there is no cause for concern. The outer splash shields forward are heavily corroded between overlapping plates of steel (Figure 49).

Figure 48 Main Deck (Looking Aft from Stem)

Figure 49 Heavy Rust/Scale at Overlapping Plating (Left), Corroded Base of Handrail Stanchion on Main Deck Forward to Starboard (Middle), Wasted Handrail Stanchion on Main Deck Forward to Starboard (Right)

Repair/replace the steel lifeline stanchions requiring new bases. Consider netting to be fitted as a safety precaution on the lifelines.

Repair the wasted lifeline loose strands emanating from the lifeline around the perimeter of the forward main deck

Clean, on a systemic basis, the main deck margin plates and flush overboard drains of debris.

Repair the wooden deck on an 'as needed' basis.

Prepare, prime and paint surfaces as needed.

4.12.3 TURRET No.2 TO MAIN MAST

This area of main deck (Figure 50) takes in the covered area just aft of Turret No.2 to the middle of the amid-ships house thence it opens into a normal weather deck as you proceed aft toward the main-mast. The enclosed area (Figure 51) was constructed to allow the 5 in. side mounts to fire and be afforded the armor protection of the enclosure from shot/shell and sea spray. The deck is planked with pine decking and is painted throughout. The main deck is very well marked with an easy flow for moving the visiting public to the various tour routes, both topsides and below.

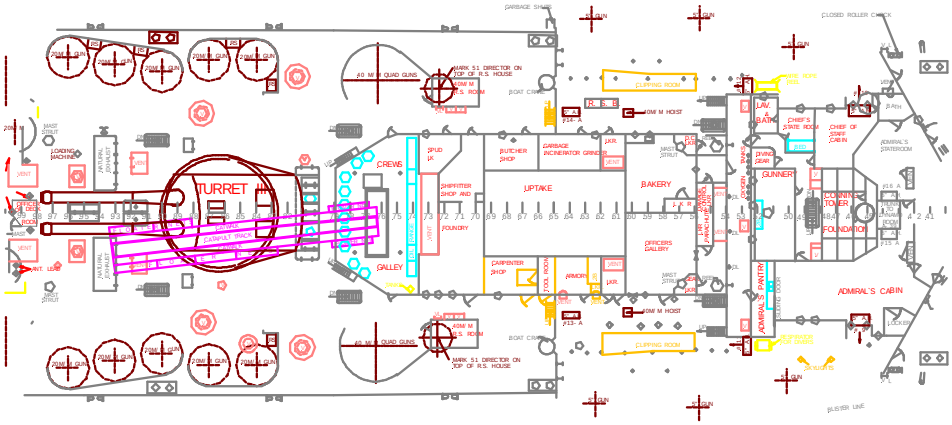

Figure 50 Turret No. 2 to Main Mast

Figure 51 Main Deck Under Enclosure (Looking Aft to Port)

This area of the main deck appears to be in good structural condition being heavily constructed. The effects of poor drainage are apparent in the athwartships passageway where water has started to corrode the overhead scantlings and plating. The gun mounts rest on the wooden decking and corrosion/rot are apparent (Figure 52, Figure 53 and Figure 54).

Figure 52 Wasted Wooden Decking on Main Deck (Trip/Fall Hazard)

Figure 53 5 in. Gun Under Armored Enclosure (Wasted Wooden Decking Beneath Foundation and Steel Decking Impacted Within the Area Adjacent to Mounts)

Figure 54 Rust/Scale and Deterioration of Scantlings on Overhead in Athwartships Passageway

The gun mounts themselves have experienced the effects of rust/scale due to delaminated painting system. Issues of drainage continue to cause recurring damage to paint system, handrail stanchions and deck structure. The stanchions for handrails are badly affected in some areas. The handrail lifelines have wire burrs. The side deck margins have rust/scale from dirt/standing water and is an endemic problem.

Ventilator, gun tub and davit bases are impacted by standing water adjacent to the wooden decking causing serious degradation with the passage of time. Main deck hatches are also facing the same issues with wasted frames where they are fitted flush to the wooden decking (Figure 55 and Figure 56).

Figure 55 Standing Debris Over Deck Drain on Margin Plate to Starboard

Figure 56 Main Deck (Looking Forward to Port; Wooden Decking Being Replaced by Vessel's Maintenance Crew)

Properly maintain handrail lifelines by wire brushing to remove wire burrs.

Inspect handrail stanchions for degradation and consider utilizing drawing templates for making replacements before it becomes necessary; some of these stanchions and bases require immediate repair.

Prep, prime and paint areas of the deck, margins and railings as needed.

Channels can be created to force water run-off where water tends to pool.

Creative methodologies for shedding/drainage water is key to avoid all consuming rust/scale issues.

Removal and repair/replacement of wasted bases at the bases of ventilators cowling, gun tubs and davit bases is badly needed.

Concrete in all gun tubs (primarily in 3" 50 Cal. Mounts) should be removed immediately and new steel plating installed as needed. Prime and paint

Repair/replace wood decking and structural foundations of mounts as needed, repair/replace wasted steel decking and install new steel deck as needed.

Remove border deck wooden pieces, prep, prime and paint affected steel and re-install wooden decking as needed.

4.12.4 MAINMAST TO STERN

This area of main deck (Figure 57) takes in the area aft of the mainmast to the stern. The deck is planked with what appears to be yellow pine/fir decking and is painted throughout. The main deck is very well marked with an easy flow for moving the visiting public to the various tour routes, both topsides and below.

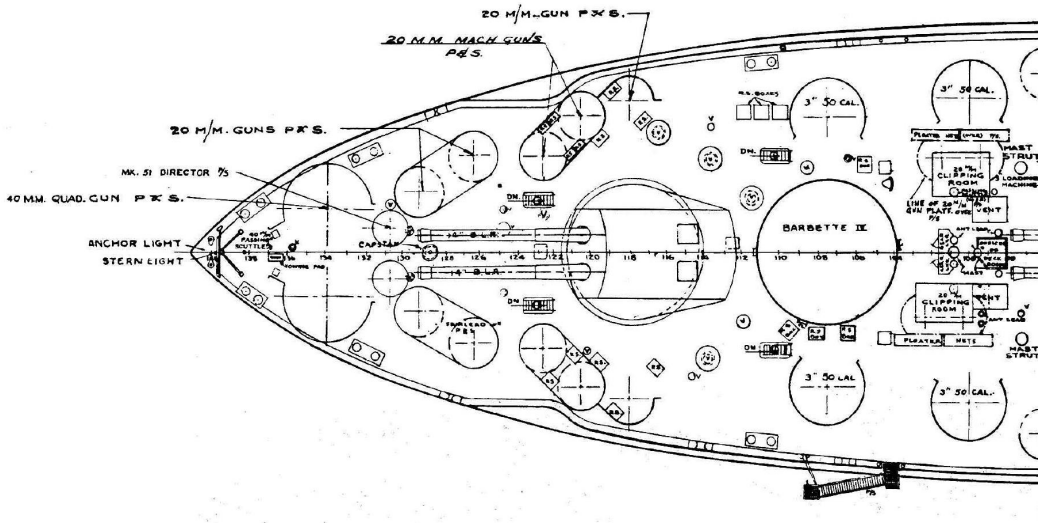

Figure 57 Main Deck Layout form Main Mast to Stern

This area of the main deck (Figure 58 and Figure 59) appears to be in good structural condition being heavily constructed. The gun mounts rest on the wooden decking and corrosion/rot are apparent. The gun mounts themselves have experienced the effects of rust/scale due to delaminated painting system.

Figure 58 Fantail (Looking Aft to Starboard)

Figure 59 Fantail on Main Deck (Looking Forward)

Issues of drainage continue to cause recurring damage to paint system, handrail stanchions and deck structure (Figure 60, Figure 61, Figure 62 and Figure 63). The stanchions for handrails are badly affected in some areas. The handrail lifelines have wire burrs. The side deck margins have rust/scale from dirt/standing water and is an endemic problem. The ventilator, gun tub and davit bases are impacted by standing water adjacent to the wooden decking causing serious degradation with the passage of time. Removal and replacement of wasted bases and cowlings at the bases of these components is ongoing and is badly needed. Main deck hatches are also facing the same issues with wasted frames where they are fitted flush to the wooden decking.

Figure 60 Concrete Poured Into Base of 3 in. Gun Causing Heavy Rust/Scale to Mount and Underlying Main Deck

Figure 61 Deck Repair Underway (Forward of Main Mast)

Figure 62 Debris and Rust/Scale on Main Deck (Aft)

Figure 63 Stern Flag Pole Brace Severely Holed from Corrosion

Some stanchions and bases require immediate repair.

Remove concrete from gun tubs, repair/replace decking and structural foundations of mounts as needed and re-install new steel deck as needed.

Remove border deck wooden pieces, prep, prime and paint affected steel and re-install wooden decking as needed.

Properly maintain handrail lifelines by wire brushing to remove wire burrs.

Inspect handrail stanchions for degradation and consider utilizing drawing templates for making replacements before it becomes necessary

Prepare, prime and paint areas of the deck, margins and railings as needed.

5 TOPSIDES AND BLISTER TANKS

5.1 HULL ABOVE WATERLINE

The hull above the waterline was not inspected at time of survey to the extent that the interior has been done. The boat/ladder did not afford an opportunity to see the shell plating up close; however, a large number of high resolution images of both sides of the ship were taken for review.

The paint system is largely intact above the waterline except in the vicinity of the fairing pieces for the blister tanks. Overboard discharges have been attended to with a minimum of rust/scale present.

The hull in the intertidal zone is deteriorated with wasted paint system and has freely eroding shell plating; this is becoming a serious issue on both sides of the bow back to the armor belt. Serious leaks have already opened up on the starboard side at/below the waterline; many past repair patches (some of them relatively recent) are apparent to starboard.

The port side, opposite to the wastage on the starboard side, is also displaying wastage and mild seepage at riveted seams, particularly aft. This will require the same degree of repair as on the starboard side.

References to the topsides on TEXAS, are references mostly to the tops of the blister tanks. The isometric drawing of the blister tankage is included within the design discussion, but is repeated in Figure 64 for clarity.

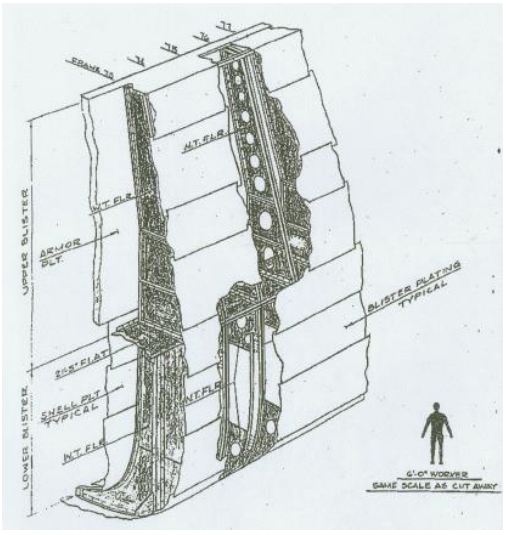

Figure 64 Isometric Drawing of Blister Tankage

Observations of the hull plating before the blister tankage showed some patching to starboard and new plating fitted to port during the last shipyard progression. The condition of stem plating is good for the most part, except at the waterline. Observations of the hull plating aft of the blister tankage showed much patching to both starboard and port side plating as well as new plating fitted to port during the last shipyard progression. The condition of stern plating is poor over all areas, especially at the wind/waterline (Figure 65).

Figure 65 Stem and Stern Hull Plating

The blister tankage shows graphic evidence of structural failure of interior scantlings and wasted plating. Tugs have previously heavily compressed surface plating (Figure 66). Other areas show no failure of the underlying frames & structural members. Oil canning is most prominent.

Figure 66 Exterior of Blister Tankage

A pair of blister tanks were inspected by ISHOT 550 camera from topsides and the photographs

show that there is little to no structural support for the exterior shell plating.

Figure 67 Blister Tank Showing Broken Access Ladder and Wasted Transverse Web Frame (Armor Belt to Left)

Figure 68 Lower Transverse Bulkhead Within Blister Tank Showing "Swiss Cheese" Effect (Note Riveted Seam That Previously Had been Fastened to Armor Belt at Left)

Figure 69 Failed Riveted Seam and Heavy Scaling of Armor Within Blister Tank

Figure 70 Totally Failed Transverse Web Frame Within Blister Tank

Tank scantlings should be repaired/replaced to give the blister tank shell plating 'something' where it can attach and rest it's great weight. This repair can be accomplished 'in the water'.

6 INTERIOR SPACES ABOVE MAINDECK

6.1 CITADEL, RADIO ROOM

This structure (Figure 71) is in rough cosmetic condition with stripped out wiring harness, equipment and furniture missing. The space needs restoration.

Figure 71 Radio Room

Prepare, prime and paint space as needed.

6.2 FLAG BRIDGE INTERIOR & ADMIRAL'S AT-SEA CABIN

This space (Figure 72) is in rough cosmetic condition with stripped out wiring harness, equipment and furniture missing. The space needs restoration. Standing water (Figure 73) is present in this space.

Figure 72 Flag Bridge Interior

Figure 73 Standing Water Within Flag Bridge

Cure intruding water ingress from overhead **Prepare, prime and paint space as needed.**

6.3 NAVIGATION BRIDGE

This space (Figure 74) is in excellent cosmetic and structural condition.

Figure 74 Navigation Bridge

6.4 BRIDGE RADIO ROOM

This space (Figure 75) is in great cosmetic condition, but there is holed vertical plating on the aft bulkhead at deck.

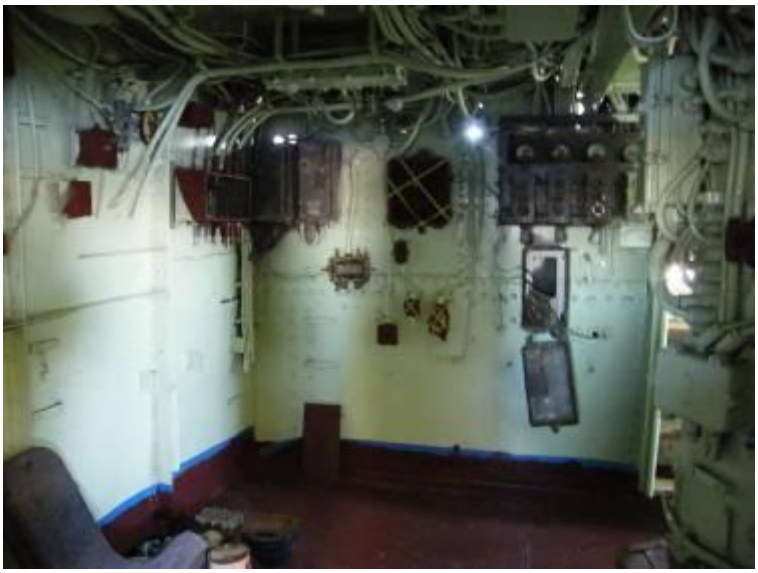

Figure 75 Bridge Radio Room

Repair aft vertical holed bulkhead as needed.

6.5 CHART HOUSE

This space (Figure 76) is in excellent cosmetic and structure condition.

Figure 76 Chart House

6.6 COMBAT INFORMATION CENTER

This space (Figure 77) is in a poor cosmetic condition and good structural condition and is largely used for storage.

Figure 77 Combat Information Center

Prepare, prime and paint space as needed.

6.7 ARMORED CONNING STATION

This space (Figure 78) is largely in excellent cosmetic and structural condition but suffers from worker debris and tools strewn about the space.

Figure 78 Forward Armored Conning Station

6.8 SUPERSTRUCTURE DECK

The layout of this space is shown in Figure 79.

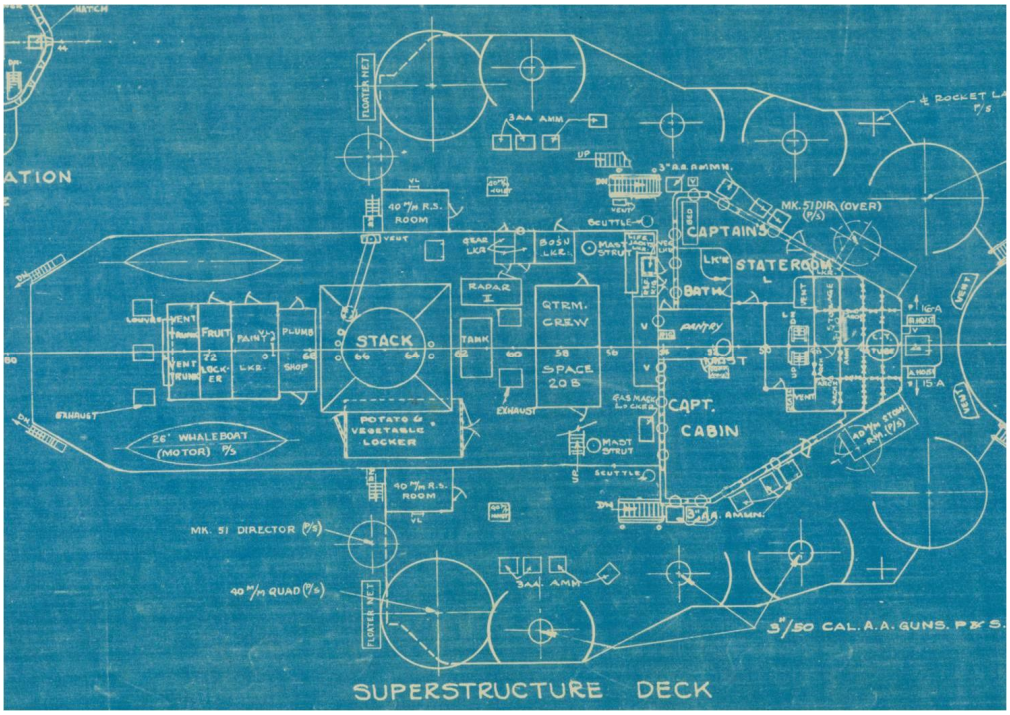

Figure 79 Superstructure Deck Layout

6.8.1 CAPTAIN'S IN-PORT CABIN & STATEROOM

Both spaces (Figure 80 and Figure 81) are in excellent cosmetic and structural condition. The enclosed head off the Captain's stateroom is operational, but in need of cleaning/restoration.

Figure 80 Captain's In-Port Cabin

Figure 81 Captain's Stateroom (Utilized as Surveyor's Office During Inspection)

6.8.2 STORAGE LOCKERS

This space (Figure 82) is largely in fair cosmetic and good structural condition and the spaces are utilized for lifejackets, 20 MM barrels & 40 MM barrel storage.

Figure 82 Storage Lockers on Superstructure Deck

Prepare, prime and paint space as needed.

6.8.3 CARPENTER SHOP

This space (Figure 83) is largely in fair cosmetic and good structural condition and spaces are utilized for light tools, personal gear and spare lumber stock/ storage.

Figure 83 Carpenter Shop

Prepare, prime and paint space as needed.

7 MAIN DECK INTERIOR SPACES

The layout of the main deck interior spaces in shown in Figure 84.

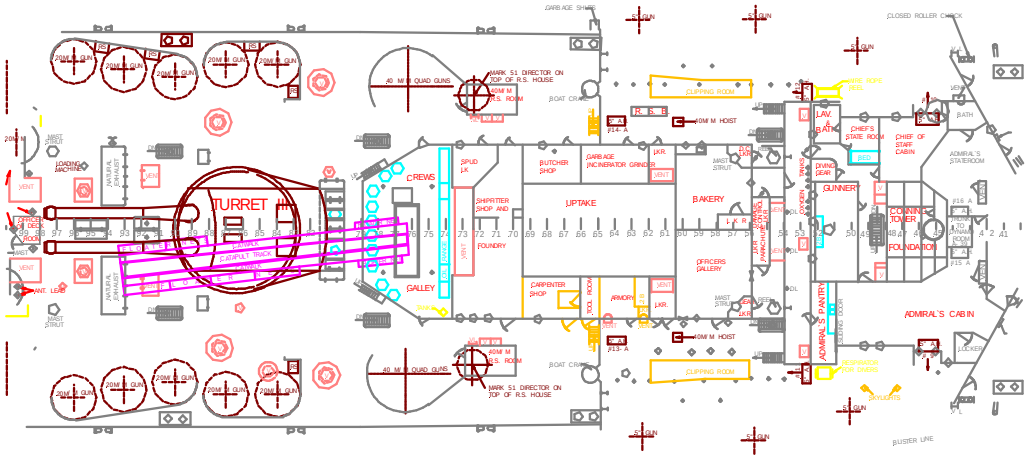

Figure 84 Layout of Main Deck Interior Spaces

7.1 ADMIRAL'S STATEROOM

Located to starboard, this space (Figure 85) now houses the Curatorial Office with the file cabinets, desks, tables associated with a collection. The space is well lighted and in good cosmetic and structural condition.

Figure 85 Admiral's Stateroom

7.2 CHIEF OF STAFF STATEROOM/LIBRARY

Located to port, these spaces (Figure 86) have been converted to the library and storage/offices and are in good structural and cosmetic condition.

Figure 86 Chief of Staff Stateroom/Library

7.3 BAKERY

To port, and largely original, the Bakery space is in excellent cosmetic and structural condition.

Prepare, prime and paint space as needed.

7.4 OFFICER'S GALLERY/MOVIE THEATER

To starboard and largely original, this space (Figure 87) is in excellent cosmetic and structural condition.

Figure 87 Officer's Gallery/Movie Theater

Prepare, prime and paint space as needed.

7.5 ARMORY

To starboard, this space (Figure 88) contains the main Power Distribution Panel and is in good cosmetic and structural condition.

Figure 88 Armory

7.6 FOUNDRY/SHIPFITTER SHOP

An athwartships space, this space (Figure 89) contains all manner of tools, work benches, power equipment and storage for the Maintenance Crew's gear. This space is in fair/good cosmetic and structural condition. The overhead under the air defense tower is rusted/scaled through and is in need of repair (Figure 90).

Figure 89 Shipfitter Shop (Looking to Port)

Figure 90 Waster Overhead in Shipfitter Shop

Repair overhead as needed with new steel.
Prepare, prime and paint space as needed

7.7 CREW GALLEY

Open on main deck as an exhibit area, this space (Figure 91) suffers from rusted/scales/wasted steel decks underneath the concrete overlay.

Figure 91 Galley Space (Looking to Port)

Also, vertical sides at the bases of bulkheads are rotting away and have failed in many areas of the galley (Figure 92; see also Figure 93).

Figure 92 Wasted Vertical Steel at Bulkhead in Crew Galley

Figure 93 Wasted Stove Vertical Surfaces (Endemic of Whole Space)

Repair overhead as needed with new steel.
Prepare, prime and paint space as needed.
Repair/replace waster/scaled steel bulkheads and floors as needed.

8 SECOND DECK

8.1 INTERIOR SPACES (STEM TO FRAME No. 48)

The layout of this space is shown in Figure 94.

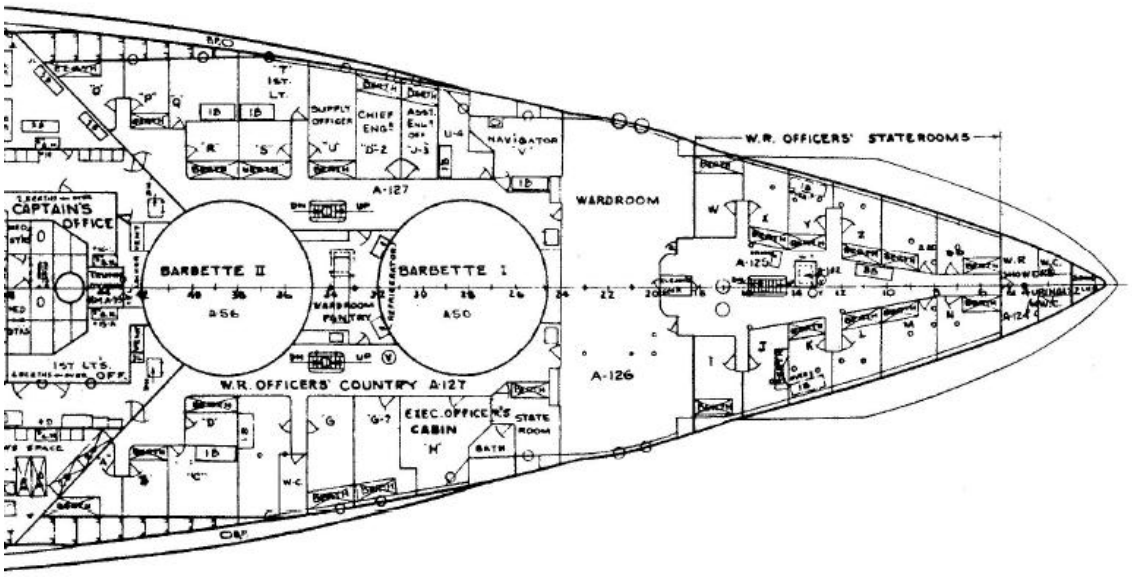

Figure 94 Stem to Frame No. 48

8.1.1 OFFICER'S HEAD, A-124, FRAMES 2 - 5

This space is in good structural and cosmetic condition.

8.1.2 STATEROOM 'N'

This space (Figure 95) is in good structural and cosmetic condition.

Figure 95 Stateroom "N"

8.1.3 STATEROOM 'M'

This space (Figure 96) is in good structural and poor cosmetic condition.

Figure 96 Stateroom "M"

Prepare, prime and paint space.

8.1.4 STATEROOM 'L'

This space (Figure 97) is in good structural and poor cosmetic condition.

Figure 97 Stateroom "L"

Prepare, prime and paint space.

8.1.5 STATEROOM 'K'

This space (Figure 98) is in good structural and poor cosmetic condition.

Figure 98 Stateroom "K"

Prepare, prime and paint space.

8.1.6 STATEROOM 'J'

This space was not observed during the inspection.

8.1.7 STATEROOM 'BB'

This space (Figure 99) is in good structural and poor cosmetic condition. There were minor leaks from overhead.

Figure 99 Stateroom "BB"

Seal deck leaks on overhead. Prepare, prime and paint space.

8.1.8 STATEROOM 'Z'

This space (Figure 100) is in good structural and poor cosmetic condition. There were minor leaks from overhead.

Figure 100 Stateroom "Z"

Seal deck leaks on overhead. Prepare, prime and paint space.

8.1.9 STATEROOM 'Y'

This space (Figure 101) is in good structural and poor cosmetic condition. There were minor leaks from overhead.

Figure 101 Stateroom "Y"

Seal deck leaks on overhead. Prepare, prime and paint space.

8.1.10 STATEROOM 'X'

This space (Figure 102) is in good structural and poor cosmetic condition. There were minor leaks from overhead.

Figure 102 Stateroom "X"

Seal deck leaks on overhead. Prepare, prime and paint space.

8.1.11 STATEROOM 'W'

This space (Figure 103) is in good structural and poor cosmetic condition.

Figure 103 Stateroom "W"

Prepare, prime and paint space.

8.1.12 PASSAGEWAY, FRAMES 5 – 20

This space (Figure 104) is in excellent structural and cosmetic condition.

Figure 104 Passageway (Frames No. 5 – 20)

8.1.13 WARDROOM, FRAMES 18 ½ - 24

This space (Figure 105) is in excellent structural and cosmetic condition.

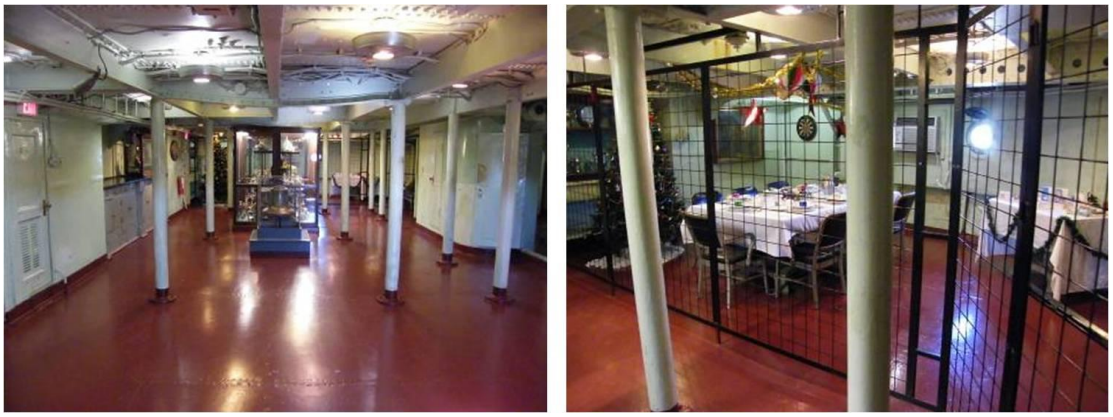

Figure 105 Wardroom (Frames No. 18 ½ - 24)

8.1.14 STARBOARD SIDE

8.1.14.1 XO STATEROOM

This space (Figure 106) is in good structural and poor cosmetic condition. There are large amounts of debris, workman's paint cans and discarded tools as well as much rust/scale throughout the space.

Figure 106 XO Staterooms (Starboard)

Prepare, prime and paint space.

8.1.14.2 STATEROOM 'H'

This space (Figure 107) is in good structural and poor cosmetic condition, and there is much debris and loose gear in this space.

Figure 107 Stateroom "H" (Starboard)

Prepare, prime and paint space.

8.1.14.3 STATEROOM G-2, (SHOP)

Utilized as a work shop and storage for spares, tools, etc. this space (Figure 108) is in good structural and good cosmetic condition.

Figure 108 Stateroom G-2 (Starboard)

Prepare, prime and paint space.

8.1.14.4 STATEROOM 'G'

This space (Figure 109) is in good structural and poor cosmetic condition with heavy rust/scale present throughout the space.

Figure 109 Stateroom "G" (Starboard)

Prepare, prime and paint space.

8.1.14.5 HEAD W.C.

This space (Figure 110) is in good structural and poor cosmetic condition. There is heavy rust/scale present throughout the space with holed exterior plating.

Figure 110 Head W.C (Starboard)

Repair holed exterior shell plating, remove debris in space. **Prepare, prime and paint space.**

8.1.14.6 STATEROOM 'E'

This space (Figure 111) is in good structural and poor cosmetic condition.

Figure 111 Stateroom "E" (Starboard)

Prepare, prime and paint space.

8.1.14.7 STATEROOM 'D'

This space (Figure 112) is in good structural and good cosmetic condition.

Figure 112 Stateroom "D" (Starboard)

Prepare, prime and paint space.

8.1.14.8 STATEROOM 'C'

This space (Figure 113) is in good structural and fair cosmetic condition. There is rust/scale and debris throughout the space.

Figure 113 Stateroom "C" (Starboard)

Prepare, prime and paint space.

8.1.14.9 STATEROOM 'B'

This space is in poor structural and cosmetic condition. There is rust/scale and debris throughout the space as well as wasted away deck that needs replacement.

Figure 114 Stateroom "B" (Starboard)

Repair wasted deck as this is a safety issue.

Prepare, prime and paint space.

8.1.14.10STATEROOM 'A'

This space is in poor structural and cosmetic condition with rust/scale and debris throughout the space. The deck is wasted away and needs replacement.

Figure 115 Stateroom "A" (Starboard)

Repair wasted deck as this is a safety issue.

8.1.15 PORT SIDE

8.1.15.1 NAVIGATOR'S STATEROOM

Utilized as a storeroom/work space, this space (Figure 116) is in excellent structural and cosmetic condition.

Figure 116 Navigator's Stateroom (Port)

8.1.15.2 STATEROOM U-4

Utilized as a storeroom, there is much rust/scale throughout this space (Figure 117).

Figure 117 Stateroom U-4 (Port)

Prepare, prime and paint space.

8.1.15.3 STATEROOM 'U-3'

Utilized as a storeroom, there is much rust/scale throughout this space (Figure 118).

Figure 118 Stateroom "U-3" (Port)

Prepare, prime and paint space.

8.1.15.4 STATEROOM 'U-2'

This space (Figure 119) is in good structural and poor cosmetic condition. Utilized as a storeroom, there is much rust/scale throughout this space.

Figure 119 Stateroom "U-2" (port)

Prepare, prime and paint space.

8.1.15.5 STATEROOM 'U-1

This space (Figure 120) is in good structural and poor cosmetic condition.

Figure 120 Stateroom "U-1" (Port)

Prepare, prime and paint space.

8.1.15.6 STATEROOM 'S'

This space was not observed.

8.1.15.7 STATEROOM 'T'

This space (Figure 121), utilized as a store room, is in good structural and cosmetic condition.

Figure 121 Stateroom "T" (Port)

Prepare, prime and paint space.

8.1.15.8 STATEROOM 'R'

This space (Figure 122) is in good structural and cosmetic condition.

Figure 122 Stateroom "R" (Port)

Prepare, prime and paint space.

8.1.15.9 PASSAGEWAY, OFFICER'S COUNTRY (FRAMES 24-43; A-127)

This space is in great cosmetic and structural condition.

Figure 123 Passageway, Officer's Country (Frames 24-43; A-127; Port)

8.1.15.10 WARDROOM PANTRY (FRAMES 32 – 35)

This space (Figure 124) is in great cosmetic and structural condition.

Figure 124 Wardroom Pantry (Frames 32-35; Port)

8.2 FRAME No. 42 TO FRAME No. 103

The layout of this space is shown in Figure 125.

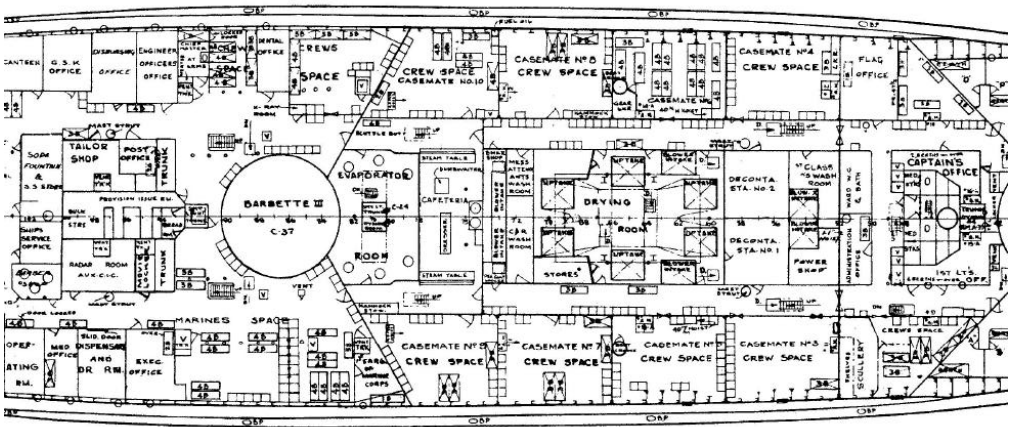

Figure 125 Layout of Second Deck (Frame No. 42 to Frame No. 103)

8.2.1 PORTSIDE

8.2.1.1 CREW BERTHING

This space (Figure 126) is in great cosmetic and structural condition.

Figure 126 Crew Berthing Space (Port)

8.2.1.2 FLAG OFFICE

Utilized as an electrical parts storage room, this space (Figure 127) is in great cosmetic and structural condition.

Figure 127 Flag Office (Port)

8.2.1.3 CREW SPACE, CASEMATE No.4

This space (Figure 128) is in good structural and cosmetic condition.

Figure 128 Crew Space (Casemate No. 4; Port)

Prepare, prime and paint space.

8.2.1.4 CREW SPACE, CASEMATE No. 6

Utilized for berthing for the 'overnight program', this space (Figure 129) is in excellent structural and cosmetic condition.

Figure 129 Crew Space (Casemate No. 6; Port)

8.2.1.5 CREW SPACE, CASEMATE No.8

Utilized for berthing for the 'overnight program', this space (Figure 130) is in excellent structural and cosmetic condition. This space is utilized by groups 'camping' onboard in the "overnight" program.

Figure 130 Crew Space (Casemate No. 8; Port)

8.2.1.6 CREW SPACE, CASEMATE No.10

This space is utilized by groups "camping" on board the vessel in the 'overnight program'; this space (Figure 131) is in excellent structural and cosmetic condition. .

Figure 131 Crew Space (Casemate No. 10; Port)

8.2.1.7 CREW SPACE (FRAMES 79-86)

Utilized as the shipboard Engineer's Office & crew space, this space (Figure 132) is in excellent

structural and cosmetic condition.

Figure 132 Crew Space (Frames 79-86; Port)

8.2.1.8 DENTAL OFFICE

This space (Figure 133) is in excellent structural and cosmetic condition.

Figure 133 Dental Office (Port)

8.2.1.9 CHIEF MASTER AT ARMS OFFICE

This space was not observed.

8.2.1.10 ENGINEER'S OFFICE

This space (Figure 134) , utilized for storage, is in good structural and good cosmetic condition.

Figure 134 Engineer's Office (Port)

Prepare, prime and paint space.

8.2.1.11 DISBURSING OFFICE

This space was not observed.

8.2.1.12 GSK OFFICE

This space (Figure 135), utilized for storage, in good structural and good cosmetic condition.

Figure 135 GSK Office (Port)

Prepare, prime and paint space.

8.2.1.13 CANTEEN

This space (Figure 136) is in excellent structural and cosmetic condition.

Figure 136 Canteen (Port)

8.2.1.14 LAUNDRY

This space (Figure 137) is in excellent structural and cosmetic condition.

Figure 137 Laundry (Port)

8.2.1.15 PASSAGEWAY

This space (Figure 138) is in excellent structural and cosmetic condition.

Figure 138 Passageway (Port)

8.2.2 STARBOARD SIDE

8.2.2.1 SCULLERY

This structure (Figure 139) is in good structural and good cosmetic condition.

Figure 139 Scullery (Starboard)

Prepare, prime and paint space.

8.2.2.2 CREW SPACE (CASEMATE No.1)

This space (Figure 140) is being currently restored, and is in good structural and cosmetic condition.

Figure 140 Crew Space (Casemate No. 1; Starboard)

Prepare, prime and paint space.

8.2.2.3 CREW SPACE (CASEMATE No.3)

This space is in good structural and good cosmetic condition.

Figure 141 Crew Space (Casemate No. 3)

Prepare, prime and paint space.

8.2.2.4 CREW SPACE, CASEMATE No. 5, CURATORIAL OFFICE

This space (Figure 142) is in good structural and good cosmetic condition.

Figure 142 Crew Space (Casemate No. 5, Curatorial Office; Starboard)

Prepare, prime and paint space.

8.2.2.5 CREW SPACE, CASEMATE No.7, STOREROOM

This space (Figure 143) is in good structural and poor/fair cosmetic condition. Much debris in this

space could be removed.

Figure 143 Crew Space (Casemate No. 7, Storeroom; Starboard)

Prepare, prime and paint space. **Remove debris.**

8.2.2.6 CREW SPACE, CASEMATE No.9, LUNCH ROOM

This space (Figure 144) is in good structural and good cosmetic condition.

Figure 144 Crew Space (Casemate No. 9, Lunch Room; Starboard)

Prepare, prime and paint space.

8.2.2.7 SGT. OF MARINES OFFICE

This space (Figure 145) is in excellent structural and cosmetic condition.

Figure 145 Sgt. of Marines Office (Starboard)

8.2.2.8 MARINE BERTHING

This space (Figure 146) is in excellent structural and cosmetic condition.

Figure 146Marine Berthing (Starboard)

8.2.2.9 EXECUTIVE OFFICE

This space (Figure 147) is in excellent structural and cosmetic condition.

Figure 147 Executive Office (Starboard)

8.2.2.10 DISPENSING OFFICE

This space (Figure 148) is in excellent structural and cosmetic condition.

Figure 148 Dispensing Office (Starboard)

8.2.2.11 MEDICAL OFFICE

This space (Figure 149) is in excellent structural and cosmetic condition.

Figure 149 Medical Office (Starboard)

8.2.2.12 OPERATING ROOM

This space (Figure 150) is in a phase of restoration with repair of broken tile needed, and painting.

Figure 150 Operating Room (Starboard)

Repair broken tile. **Prepare, prime and paint space.**

8.2.2.13 SICK BAY

This space (Figure 151) is in excellent structural and cosmetic condition.

Figure 151 Sick Bay (Starboard)

8.2.2.14 ISOLATION WARD

This space (Figure 152) is in excellent structural and cosmetic condition.

Figure 152 Isolation Ward (Starboard)

8.2.3 CENTERLINE PORT SPACES

8.2.3.1 CAPTAIN'S OFFICE, OVERNIGHT PROGRAM OFFICE

This space (Figure 153) is in excellent structural and cosmetic condition.

Figure 153 Captain's Office (Overnight Program Office)

8.2.3.2 MEDICAL STORES

This space (Figure 154) is in excellent structural and cosmetic condition.

Figure 154 Medical stores

8.2.3.3 ADMININISTRATIVE OFFICE

This space (Figure 155) is in good structural and poor/fair cosmetic condition; much of the debris could be removed.

Figure 155 Administrative Office

Prepare, prime and paint space. **Remove debris.**

8.2.3.4 WARDROOM W.C.

This space (Figure 156) is in good structural and poor/fair cosmetic condition; much of the debris could be removed.

Figure 156 Wardroom W.C

Prepare, prime and paint space.

Remove debris.

8.2.3.5 DECONTAMINATION STATION No.2

This space is in good structural and poor/fair cosmetic condition; much of the debris could be removed.

Prepare, prime and paint space.

Remove debris.

8.2.3.6 DRYING ROOM

In this space (Figure 157), there is much corrosion on uptakes, decks and bulkheads with heavy wastage on uptake covers. The deck is thin in areas, but is not a serious cause for concern at this time.

Figure 157 Drying Room

Consider restoration of uptake covers if desirable. Prepare, prime and paint entire space.

8.2.3.7 WASHROOM

This space is in fair structural and cosmetic condition.

Repair wasted deck under tiled deck. Consider restoration of tiled deck.

Prepare, prime and paint entire space.

8.2.3.8 CAFETERIA

This space (Figure 158) is in excellent structural and cosmetic condition.

Figure 158 Cafeteria

8.2.3.9 POST OFFICE

This space (Figure 159) is in excellent structural and cosmetic condition.

Figure 159 Post Office

8.2.3.10 TAILOR SHOP

This space (Figure 160) is in excellent structural and cosmetic condition.

Figure 160 Tailor Shop

8.2.3.11 SODA SHOP

This space (Figure 161) is in excellent structural and cosmetic condition.

Figure 161 Soda Shop

8.2.3.12 EVAPORATOR ROOM

This space (Figure 162) is in original condition and is not opened on a regular basis. Rust/scale is prevalent on decks and bulkheads.

Figure 162 Evaporator Room

Prepare, prime and paint space.

8.2.4 CENTERLINE STARBOARD SPACES

8.2.4.1 POWER SHOP

Figure 163 Power Shop

Prepare, prime and paint space.

8.2.4.2 DECONTAMINATION STATION No.1

This space (Figure 164) is in poor material and cosmetic condition. The tiled deck is failing, indicating severe rust/scale and possible failure below. There is failed paint system throughout.

Figure 164 Decontamination Station No. 1

Consider pulling up failed tile system and renew steel deck as needed. **Prepare, prime and paint space**

8.2.4.3 RADAR ROOM

This space (Figure 165) is in excellent structural and cosmetic condition.

Figure 165 Radar Room

8.2.4.4 BARBER SHOP

This space (Figure 166) is in excellent structural and cosmetic condition.

Figure 166 Barber Shop

8.3 FRAME No. 103 TO STERN

The layout of this space is shown in Figure 167.

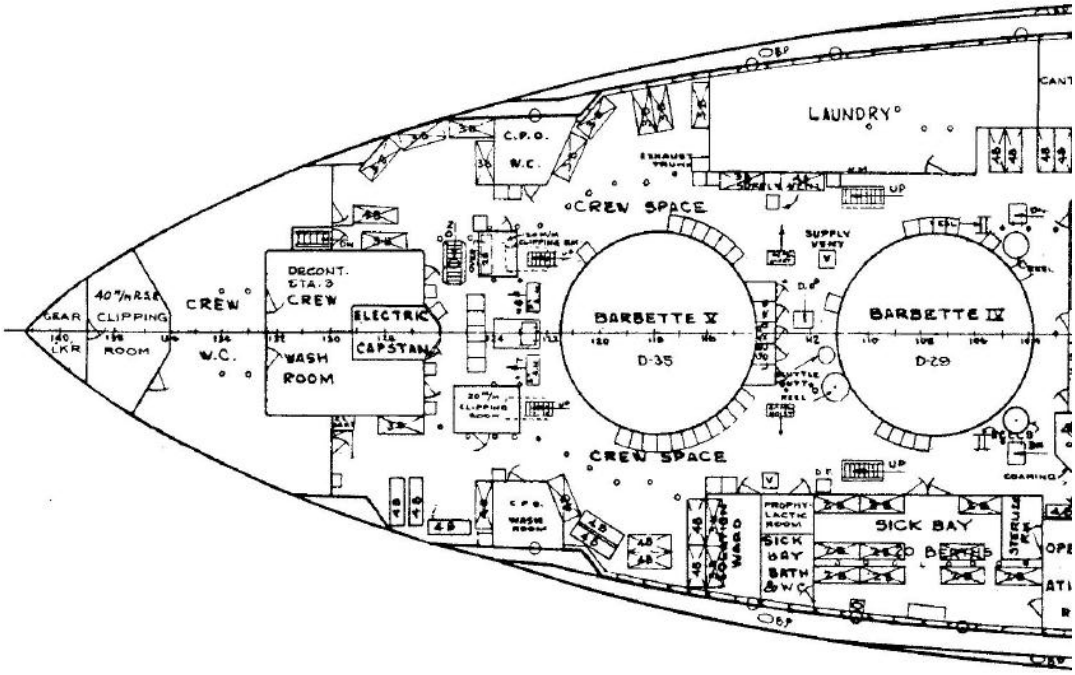

Figure 167 Layout of Second Deck (Frame No. 103 to Stern)

8.3.1 MESS DECKS AFT

This space (Figure 168) is in excellent structural and cosmetic condition.

Figure 168 Mess Decks Aft

8.3.2 CPO W.C. PORT

This space (Figure 169) is in excellent structural and cosmetic condition.

Figure 169 CPO W.C. PORT

8.3.3 DECONTAMINATION STATION No.3

This space is in excellent structural and cosmetic condition.

8.3.4 W. C. HEAD

This space (Figure 170) is in original condition and is not opened on a regular basis. Rust/scale is prevalent on decks and bulkheads.

Figure 170 W. C. Head

Prepare, prime and paint space.

8.3.5 40 MM CLIPPING ROOM

This space (Figure 171) is in excellent structural and cosmetic condition.

Figure 171 40 MM Clipping Room

8.3.6 CAPSTAN ROOM

This space (Figure 172) is in excellent structural and cosmetic condition.

Figure 172 Capstan Room

8.3.7 AFT STERN LOCKER

This space (Figure 173) is in original condition and is not opened on a regular basis. Rust/scale is

prevalent on decks and bulkheads. Steel plating has been opened up with access ports above the waterline. The access for dewatering hoses has been done on the port side aft; this can be re-plated when the lower spaces have been repaired. Steel plating has been opened up with access ports above the waterline. The access for dewatering hoses has been cut into the side shell plating on the port and starboard side aft; this can be re-plated when the lower spaces have been repaired and de-watering is not a concern.

Figure 173 Aft Stern Locker

Replace missing plating where cuts in the hull have been made. **Prepare, prime and paint space.**

9 HALF DECK FORWARD

The layout of this space is shown in Figure 174.

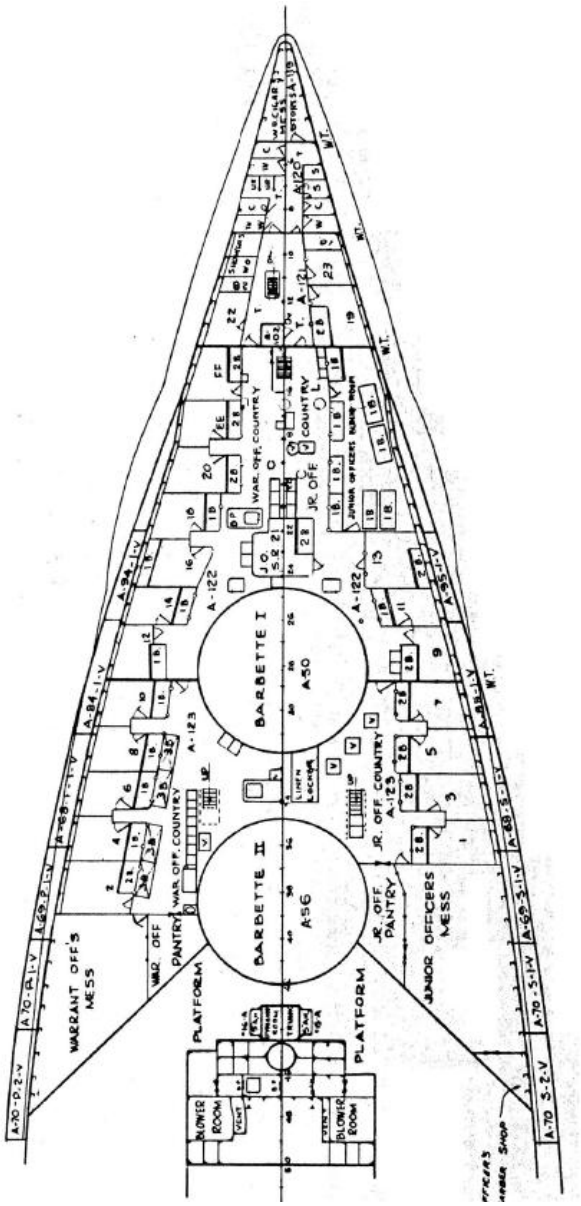

Figure 174 Layout of Half Deck Forward

There is the appearance that the minor bulkheads between staterooms are somewhat buckling from Frame 28 to Frame 40 due to the minor set-down of the maindeck with a total deflection of approximately 4-6” in various areas. This movement is hard to quantify and will need to be studied for the long term. The observations of this effect showed that structural integrity of this area is not cause for concern at this time. Eliminating standing water on maindeck and sealing leaks is paramount for stabilizing this and all areas aboard.

9.1 PORTSIDE

9.1.1 W. C. HEAD

This space (Figure 175) is in good structural and poor cosmetic condition with much of the original piping missing. Rust/scale abounds with a failed paint system.

Figure 175 W.C. Head

Prepare, prime and paint space.

9.1.2 STATEROOMS

9.1.2.1 STATEROOMS '22', '20' & '18'

These staterooms were not observed.

9.1.2.2 STATEROOM '16'

This space (Figure 176) is in good structural and poor cosmetic condition. Rust/scale abounds with a failed paint system.

Figure 176 Stateroom "16" (Port)

Prepare, prime and paint space.

9.1.2.3 STATEROOM '14'

This space (Figure 177) is in good structural and poor cosmetic condition. Rust/scale abounds with a failed paint system.

Figure 177 Stateroom "14" (Port)

Prepare, prime and paint space.

9.1.2.4 STATEROOM '12'

This space (Figure 178) is in good structural and poor cosmetic condition. Rust/scale abounds with a failed paint system.

Figure 178 Stateroom "12" (Port)

Prepare, prime and paint space.

9.1.2.5 STATEROOM '10'

This space (Figure 179) is in good structural and poor cosmetic condition. The lightly built steel separator bulkhead is buckled, but is not an indicator of any immediate structural concern. The vertical stanchions supporting the overhead are in good repair. There is much rust/scale with a failed paint system.

Figure 179 Stateroom "10" (Port)

Prepare, prime and paint space.

9.1.2.6 STATEROOM '8'

This space (Figure 180) is in good structural and poor cosmetic condition. The lightly built steel separator bulkhead has buckled, but is not an indicator of immediate structural concern. The vertical stanchions supporting overhead are in good repair. There is much rust/scale with a failed paint system.

Figure 180 Stateroom "8" (Port)

Prepare, prime and paint space.

9.1.2.7 STATEROOM '6'

This space (Figure 181) is in good structural and poor cosmetic condition. Rust/scale abounds with a failed paint system.

Figure 181 Stateroom "6" (Port)

Prepare, prime and paint space.

9.1.2.8 STATEROOM '4'

This space (Figure 182) is in good structural and poor cosmetic condition. Rust/scale abounds with a failed paint system.

Figure 182 Stateroom "4" (Port)

Prepare, prime and paint space.

9.1.2.9 STATEROOM '2'

This space (Figure 183) is in good structural and poor cosmetic condition. Rust/scale abounds with a failed paint system.

Figure 183 Stateroom "2" (Port)

Prepare, prime and paint space.

9.1.3 WARRANT OFFICER'S MESS

This space (Figure 184) is in fair/good structural and poor cosmetic condition. There is much rust/scale with a failed paint system. There is heavy rust/scale at the base of the inboard bulkhead. The simulated fireplace is of historical import.

Figure 184 Warrant Officer's Mess (Port)

Prepare, prime and paint space.

9.1.4 WARRANT OFFICER'S PANTRY

This space (Figure 185) is in good structural and poor cosmetic condition. Rust/scale abounds with a failed paint system.

Figure 185 Warrant Officer's Pantry (Port)

Prepare, prime and paint space.

9.2 STARBOARD SPACES

9.2.1 FORWARD STOREROOM

This space (Figure 186) is in good structural and poor/fair cosmetic condition. Rust/scale abounds with a failed paint system and there have been leaks from the second deck.

Figure 186 Forward Stateroom (Starboard)

Seal overhead leaks. **Prepare, prime and paint space.**

9.2.2 JUNIOR OFFICER BUNKROOM

This space (Figure 187) is in good structural and poor/fair cosmetic condition. Rust/scale abounds with a failed paint system.

Figure 187 Junior Officer Bunkroom (Starboard)

Prepare, prime and paint space.

9.2.3 STATEROOMS

9.2.3.1 STATEROOM '23'

This space (Figure 188) is in good structural and poor/fair cosmetic condition. Rust/scale abounds with a failed paint system and there have been leaks from the second deck.

Figure 188 Stateroom "23" (Starboard)

Seal overhead leaks. **Prepare, prime and paint space.**

9.2.3.2 STATEROOM '19'

This space (Figure 189) is in good structural and poor/fair cosmetic condition. Vertical stanchions supporting overhead in good repair. Rust/scale abounds with a failed paint system.

Figure 189 Stateroom "19" (Starboard)

Prepare, prime and paint space.

9.2.3.3 STATEROOM '13'

This space (Figure 190) is in good structural and poor/fair cosmetic condition. The lightly built steel separator bulkheads have buckled, but are not an indicator of immediate structural concern. The vertical stanchions supporting the overhead are in good repair. There is much rust/scale with a failed paint system.

Figure 190 Stateroom "13" (Starboard)

Prepare, prime and paint space.

9.2.3.4 STATEROOM '11'

This (Figure 191) space is in good structural and poor/fair cosmetic condition. The lightly built steel separator bulkhead has buckled, but is not an indicator of structural concern. The vertical stanchions supporting the overhead are in good repair. There is much rust/scale with a failed paint system.

Figure 191 Stateroom "11" (Starboard)

Prepare, prime and paint space.

9.2.3.5 STATEROOM '9'

This space (Figure 192) is in good structural and poor/fair cosmetic condition. The lightly built steel separator bulkhead has buckled, but is not an indicator of immediate structural concern. The vertical stanchions supporting the overhead are in good repair. There is much rust/scale with a failed paint system.

Figure 192 Stateroom "9" (Starboard)

Prepare, prime and paint space.

9.2.3.6 STATEROOM '7'

This space (Figure 193) is in good structural and poor/fair cosmetic condition. Rust/scale abounds with a failed paint system. The lightly built steel separator bulkhead has buckled, but is not an indicator of immediate structural concern. The vertical stanchions supporting the overhead are in good repair.

Figure 193 Stateroom "7" (Starboard)

Prepare, prime and paint space.

9.2.3.7 STATEROOM '5'

This space (Figure 194) is in good structural and poor/fair cosmetic condition. The lightly built steel separator bulkhead has buckled, but is not an indicator of immediate structural concern. The vertical stanchions supporting the overhead are in good repair. There is much rust/scale with a failed paint system.

Figure 194 Stateroom "5" (Starboard)

Prepare, prime and paint space.

9.2.3.8 STATEROOM '3'

This space is in good structural and poor/fair cosmetic condition. The lightly built steel separator bulkhead has buckled, but is not an indicator of immediate structural concern. The vertical stanchions supporting the overhead are in good repair. There is much rust/scale with a failed paint system.

Figure 195 Stateroom "3" (Starboard)

Prepare, prime and paint space.

9.2.3.9 STATEROOM '1'

This space (Figure 196) is in good structural and poor/fair cosmetic condition. The lightly built steel separator bulkhead has buckled, but is not an indicator of immediate structural concern. There is much rust/scale with a failed paint system.

Figure 196 Stateroom "1" (Starboard)

Prepare, prime and paint space.

9.2.4 JUNIOR OFFICER MESS

This space (Figure 197) is in good structural and poor/fair cosmetic condition. Rust/scale abounds with a failed paint system.

Figure 197 Junior Officer Mess (Starboard)

Prepare, prime and paint space.

9.2.5 JUNIOR OFFICER'S PANTRY

This space is in good structural and poor/fair cosmetic condition. Rust/scale abounds with a failed paint system.

Figure 198 Junior Officer's Pantry (Starboard)

Prepare, prime and paint space.

9.2.6 PASSAGEWAY (A-121)

This space is in good structural and poor/fair cosmetic condition. Rust/scale abounds with a failed paint system.

Figure 199 Passageway (A-121; Starboard)

Prepare, prime and paint space.

9.2.7 PASSAGEWAY (A-122)

This space (Figure 200) is in good structural and poor/fair cosmetic condition. Rust/scale abounds with a failed paint system.

Figure 200 Passageway (A-122; Starboard)

Prepare, prime and paint space.

9.2.8 PASSAGEWAY (A-123)

This space is in good structural and poor/fair cosmetic condition. Rust/scale abounds with a failed paint system.

Figure 201 Passageway (A-123; Starboard)

Prepare, prime and paint space.

10 THIRD DECK

10.1 STEM TO FRAME No. 40

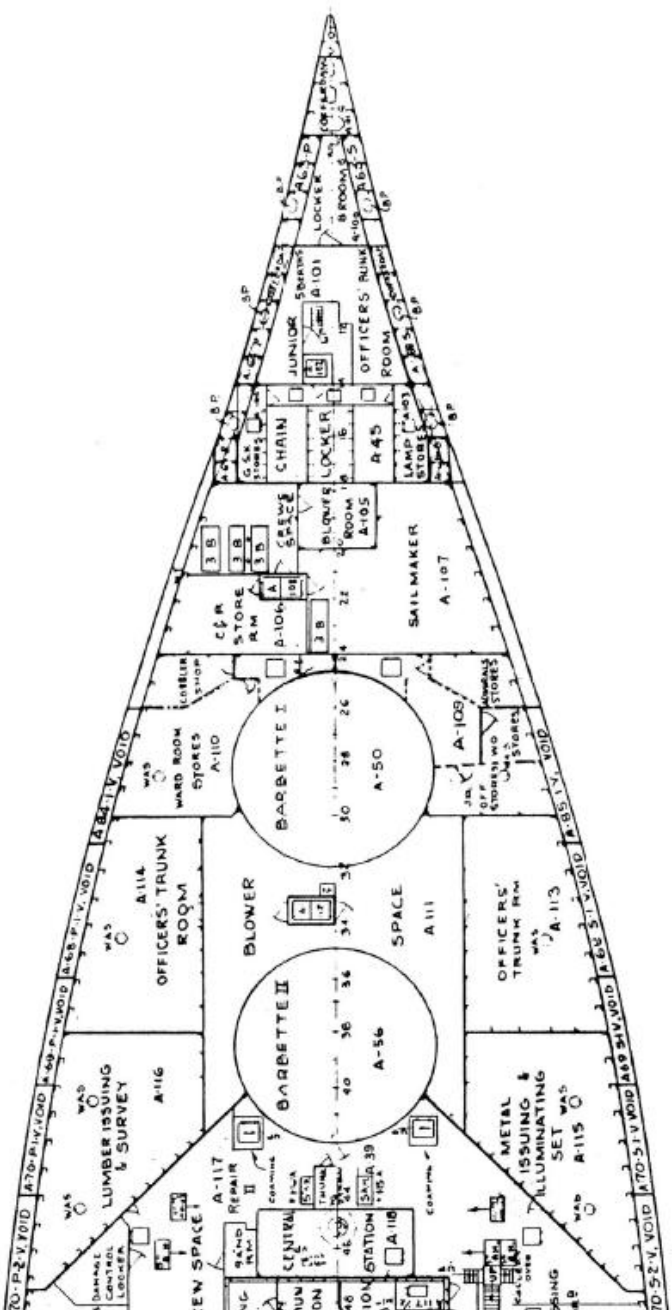

Figure 202 Layout of Third Deck (Stem to Frame No. 40)

10.1.1 COFFERDAM (STEM TO FRAME No. 5)

This space is in good structural and poor/fair cosmetic condition. Rust/scale abounds with a failed paint system.

Figure 203 Cofferdam (Stem to Frame No. 5)

Prepare, prime and paint space.

10.1.2 LOCKER ROOM (FRAMES No. 5 - 9)

This space is in good structural and poor/fair cosmetic condition. Rust/scale abounds with a failed paint system.

Figure 204 Locker Room (Frames No. 5 – 9)

Prepare, prime and paint space.

10.1.3 STORAGEROOM (FRAMES No. 9 – 14)

This space is in good structural and poor/fair cosmetic condition. Rust/scale abounds with a failed paint system.

Figure 205 Storageroom (Frames No. 9 – 14)

Prepare, prime and paint space.

10.1.4 ANCHOR CHAIN LOCKER (A-45; FRAMES No. 14 – 18)

Both lockers have chain with rust/scale, standing dirt present. This space is in good structural and poor/fair cosmetic condition. Rust/scale abounds with a failed paint system.

Figure 206 Anchor Chain Locker (A-45; Frames No. 14 – 18)

Prepare, prime and paint space.

10.1.5 STOREROOM (A-103; PORT)

This space is in good structural and poor/fair cosmetic condition. Rust/scale abounds with a failed paint system.

Figure 207 Storeroom (A-103; Port)

Prepare, prime and paint space.

10.1.6 STOREROOM (A-104; STARBOARD)

This space is in good structural and poor/fair cosmetic condition. Rust/scale abounds with a failed paint system.

Figure 208 Storeroom (A-104; Starboard)

Prepare, prime and paint space.

10.1.7 SAILMAKER SHOP (A-107, FRAMES No. 18 – 24)

This space is in good structural and poor/fair cosmetic condition. Rust/scale abounds with a failed paint system.

Prepare, prime and paint space.

10.1.8 CREW SPACE (A-104)

This space is in good structural and poor/fair cosmetic condition. Rust/scale abounds with a failed paint system.

Prepare, prime and paint space.

10.1.9 C & R STORES (A-106, FRAMES No. 18 - 24)

This space is in good structural and poor/fair cosmetic condition. Rust/scale abounds with a failed paint system.

Prepare, prime and paint space.

10.1.10 WARDROOM STORES A -110, COBBLER SHOP, ADMIRAL'S STORES, W.O STORES & OFFICER'S STORES (FRAMES No. 24 - 30; PORT AND STARBOARD)

Spaces are in good structural and poor/fair cosmetic condition. Rust/scale abounds with a failed paint system.

Prepare, prime and paint space.

10.1.11 BLOWER SPACE (A-111)

This space is in good structural and poor/fair cosmetic condition. Rust/scale abounds with a failed paint system.

Figure 209 Blower Space (A-111)

Prepare, prime and paint space.

10.1.12 OFFICER'S TRUNKROOM (A-113, STARBOARD)

This space is in good structural and poor/fair cosmetic condition. Rust/scale abounds with a failed paint system.

Figure 210 Officer's Trunkroom (A-113; Starboard)

Prepare, prime and paint space.

10.1.13 OFFICER'S TRUNKROOM (A-114; PORT)

These spaces are in good structural and poor/fair cosmetic condition. Rust/scale abounds with a failed paint system.

Figure 211 Officer's Trunkroom (A-114; Port)

Prepare, prime and paint space.

10.2 FRAMES No. 40 - 84

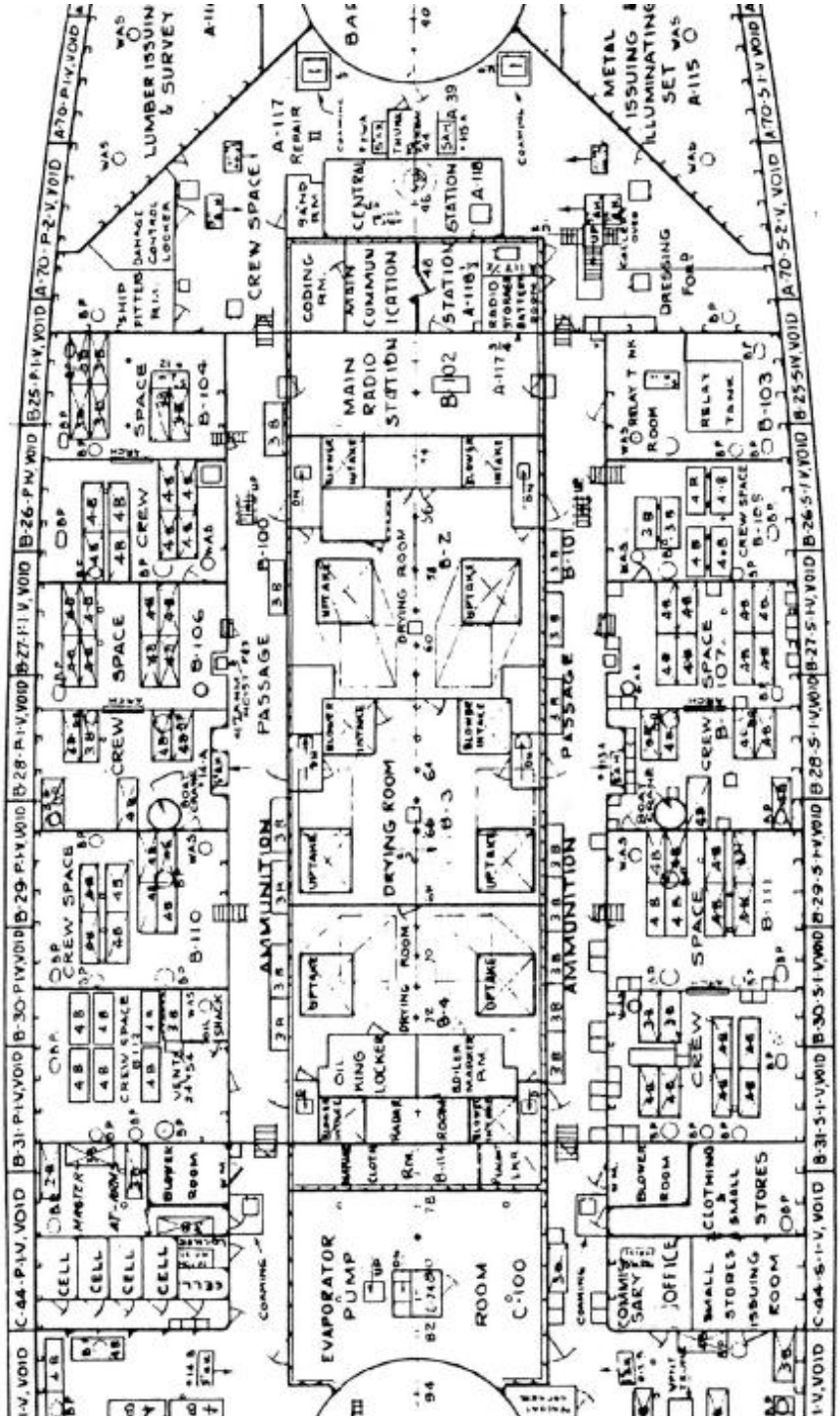

Figure 212 Layout of Third Deck (Frames No. 40 – 84)

10.2.1 PORT SIDE

10.2.1.1 LUMBER ISSUING ROOM (A-116)

This space is in good structural and poor/fair cosmetic condition. Previously flooded with oil on deck, this has largely dried, but should be cleaned. Rust/scale abounds with a failed paint system.

Figure 213 Lumber Issuing Room (A-116; Port)

Remove standing oil from space.
Prepare, prime and paint space.

10.2.1.2 DC LOCKER

This space is in good structural and fair cosmetic condition. Rust/scale abounds with a failed paint system.

Figure 214 DC Locker (Port)

Prepare, prime and paint space.

10.2.1.3 SHIPFITTER ROOM

This space is in good structural and poor/fair cosmetic condition. Rust/scale abounds with a failed paint system.

Figure 215 Shipfitter Room (Port)

Prepare, prime and paint space.

10.2.1.4 CREW SPACE (B-104; FRAMES No. 50 – 58)

This space is in good structural and poor/fair cosmetic condition. Presently flooded with water and oil on deck; should be cleaned. Rust/scale abounds with a failed paint system.

Figure 216 Crew Space (B-104; Frames No. 50-58; Port)

Remove standing oil/water from space. Repair source of water.
Prepare, prime and paint space.

10.2.1.5 CREW SPACE (B-106, FRAMES No. 58 – 66)

This space is in good structural and poor/fair cosmetic condition. Rust/scale abounds with a failed paint system.

Figure 217 Crew Space (B-106; Frames No. 58-66; Port)

Prepare, prime and paint space.

10.2.1.6 CREW SPACE (B-110, FRAMES No. 66 – 71)

This space is in good structural and poor/fair cosmetic condition. Rust/scale abounds with a failed paint system.

Figure 218 Crew Space (B-110; Frames No. 66 – 71; Port)

Prepare, prime and paint space.

10.2.1.7 CREW SPACE (B-112, FRAMES No. 71 – 76)

This space is in good structural and poor/fair cosmetic condition. Rust/scale abounds with a failed paint system.

Figure 219 Crew Space (B-112; Frames No. 71 – 76; Port)

Prepare, prime and paint space.

10.2.1.8 BLOWER ROOM

This space is in good structural and poor/fair cosmetic condition. Rust/scale abounds with a failed paint system.

Figure 220 Blower Room (Port)

Prepare, prime and paint space.

10.2.1.9 MASTER-AT-ARMS OFFICE

This space is in good structural and poor/fair cosmetic condition. Rust/scale abounds with a failed paint system.

Figure 221 Master-At-Arms Office (Port)

Prepare, prime and paint space.

10.2.1.10 BRIG

This space is in good structural and good cosmetic condition.

Figure 222 Brig (Port)

Prepare, prime and paint space.

10.2.2 STARBOARD SIDE

10.2.2.1 METAL ISSUING ROOM (A-115)

This space is in good structural and good cosmetic condition.

Figure 223 Metal Issuing Room (Starboard)

Prepare, prime and paint space.

10.2.2.2 PASSAGEWAY (B-101)

Figure 224 Passageway (B-101; Starboard)

This space is in good structural and good cosmetic condition.

Prepare, prime and paint space.

10.2.2.3 RELAY ROOM (B-103)

This space is in good structural and good cosmetic condition and utilized for storage.

Figure 225 Relay Room (B-103; Starboard)

Prepare, prime and paint space.

10.2.2.4 CREW SPACE (B-105, FRAMES No. 54 – 58)

This space is in good structural and good cosmetic condition and utilized for storage.

Figure 226 Crew Space (B-105; Frames No. 54 – 58; Starboard)

Prepare, prime and paint space.

10.2.2.5 CREW SPACE (B-107, FRAMES No. 58 – 66)

This space is in good structural and good cosmetic condition and is utilized for storage.

Figure 227 Crew Space (B-107, Frames No. 58 – 66; Starboard)

Prepare, prime and paint space.

10.2.2.6 CREW SPACE (B-111, FRAMES No. 66 - 76)

This space is in good structural and good cosmetic condition and is utilized for storage.

Figure 228 Crew Space (B-111, Frames No. 66 – 76)

Prepare, prime and paint space.

10.2.2.7 BLOWER ROOM

This space was not observed.

10.2.2.8 CLOTHING & SMALL STORES

This space is in good structural and good cosmetic condition and is utilized for storage.

Figure 229 Clothing and Small Stores (Starboard)

Prepare, prime and paint space.

10.2.2.9 COMMISSARY OFFICE

This space is in good structural and good cosmetic condition and is utilized for storage.

Figure 230 Commissary Office

Prepare, prime and paint space.

10.2.2.10 SMALL STORES ISSUING ROOM

This space was not observed.

10.2.3 CENTERLINE

10.2.3.1 MAIN COMMUNICATION STATION (A-116 ½)

This space is in good structural and fair cosmetic condition. The space is largely original.

Figure 231 Main Communication Station (A-116 ½; Centerline)

Prepare, prime and paint space.

10.2.3.2 MAIN RADIO ROOM (B-102)

This space is in good structural and fair cosmetic condition. The space is largely original.

Prepare, prime and paint space.

10.2.3.3 DRYING ROOM (B-2, FRAMES No. 53 – 62)

This space is in good structural and poor/fair cosmetic condition.

Figure 232 Drying Room (B-2, Frames NO. 53 – 62; Centerline)

Prepare, prime and paint space.

10.2.3.4 DRYING ROOM (B-3, FRAMES No. 62 – 68 ½)

This space is in good structural and poor/fair cosmetic condition. The deck is holed in several areas.

Figure 233 Drying Room (B-3, Frames No. 62 – 68 ½; Centerline)

Replace thin deck plating as needed near hatch to rear of compartment.

Prepare, prime and paint space.

10.2.3.5 DRYING ROOM (B-4, FRAMES No. 68 1/2 – 76)

This space is in good structural and poor/fair cosmetic condition. The deck is holed in several areas.

Figure 234 Drying Room (B-4, Frames No. 68 ½ - 76; Centerline)

Repair deck adjacent to ladders leading to boiler rooms below on both sides of space.

Prepare, prime and paint space.

10.2.3.6 OIL KING SHACK & BOILER MARKER ROOM WITHIN B-4 DRYDING ROOM

These spaces are in fair/good structural and poor/fair cosmetic condition. The deck is holed in several areas.

Figure 235 Oil King Shack (left panel) and Boiler Marker Room (Right Panel)

Repair deck adjacent to ladders leading to boiler rooms below on both sides of space.

Prepare, prime and paint space.

10.2.3.7 EVAPORATOR ROOM (C-100, FRAMES No. 76 – 94)

This space is in good structural and poor/fair cosmetic condition.

Figure 236 Evaporator Room (C-100, Frames NO. 76 – 94; Centerline)

Prepare, prime and paint space.

10.2.3.8 AMMUNITION PASSAGE (B-100, PORT)

This space is in good structural and poor/fair cosmetic condition.

Figure 237 Ammunition Passage (B-100; Port)

Prepare, prime and paint space.

10.2.3.9 AMMUNITION PASSAGE (B-101, STARBOARD)

This space is in good structural and good cosmetic condition.

Figure 238 Ammunition Passageway (B-101; Starboard)

Prepare, prime and paint space as needed.

10.3FRAMES 84 – 122

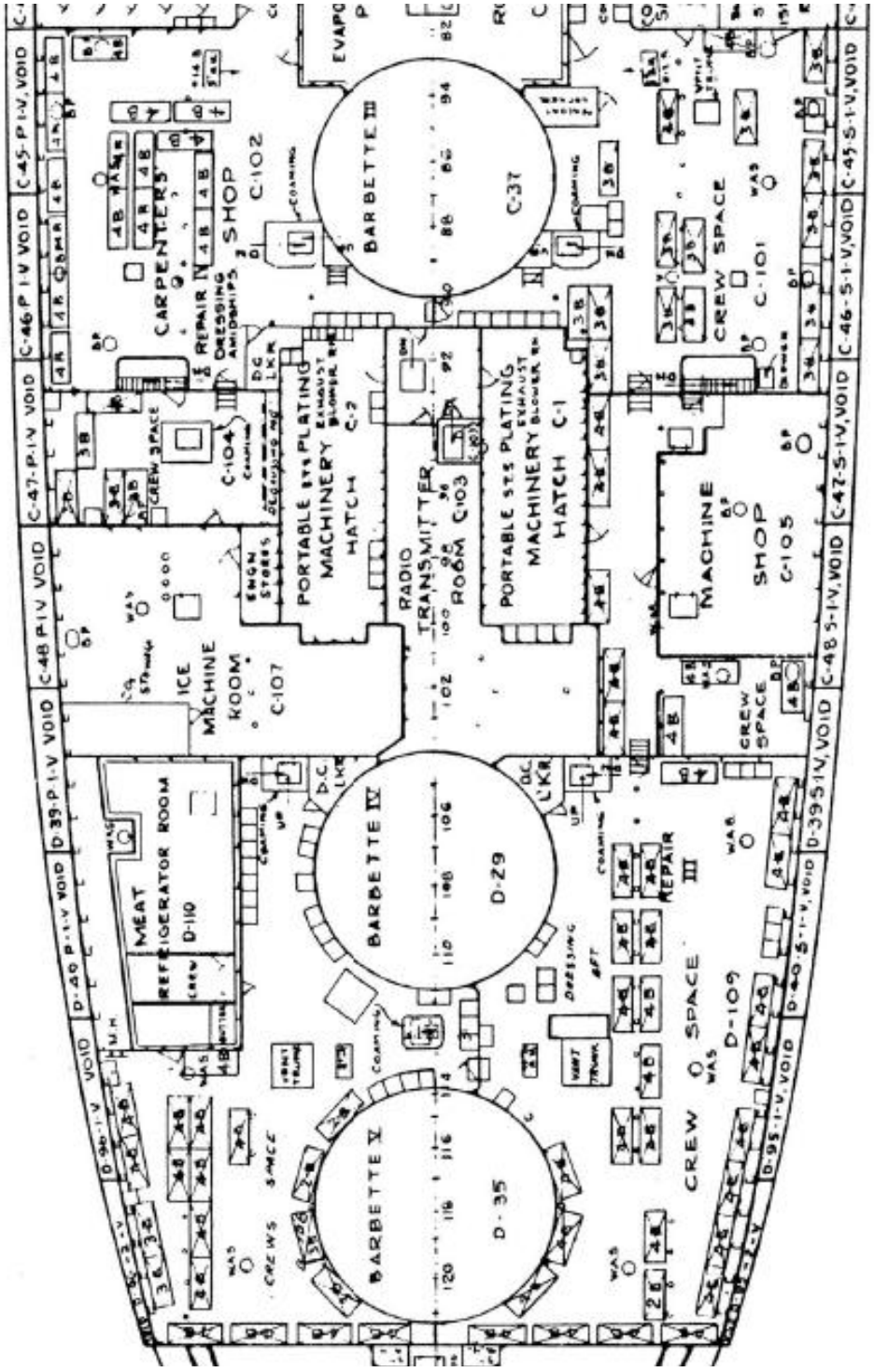

Figure 239 Layout of Third Deck (Frames No. 84 – 122)

10.3.1 CARPENTER SHOP (C-102)

This space is in good structural and good cosmetic condition. The vent is detached from overhead.


Figure 240 Carpenter Shop (C-102)

Repair wasted vent on overhead.
Prepare, prime and paint space as needed.

10.3.2 CREW SPACE (C-101)

This space is in good structural and fair cosmetic condition.


Figure 241 Crew Space (C-101)

Prepare, prime and paint space.

10.3.3 MACHINE SHOP (C-105, STARBOARD)

This space is in good structural and fair cosmetic condition.


Figure 242 Machine Shop (C-105; Starboard)

Prepare, prime and paint space.

10.3.4 RADIO TRANSMITTER ROOM (C-103, CENTERLINE)

This space is in good structural and fair cosmetic condition.


Figure 243 Radio Transmitter Room (C-103; Centerline)

Prepare, prime and paint space.

10.3.5 CREW SPACE (C-104, PORT)

This space is in good structural and fair cosmetic condition and is presently being utilized as a storage area.

Figure 244 Crew Space (C-104; Port)

Prepare, prime and paint space.

10.3.6 ICE MACHINERY ROOM (C-107, PORT)

This space is in good structural and fair cosmetic condition and is presently being utilized as a storage area.

Figure 245 Ice Machinery Room (C-107; Port)

Prepare, prime and paint space.

10.3.7 CREW SPACE (D-109, FRAMES No. 104 – 122, STARBOARD)

Utilized by the ship's crew as a workshop and a lounge area, this space is in good structural and fair cosmetic condition.

Figure 246 Crew Space (D-109, Frames No. 104 - 122; Starboard)

Prepare, prime and paint space.

10.3.8 CREW SPACE (D-109, FRAMES No. 104 – 122, PORT)

Utilized by the ship's crew as a workshop and a storage area, this space is in good structural and fair cosmetic condition.

Figure 247 Crew Space (D-104, Frames No. 104 – 122; Port)

Prepare, prime and paint space.

10.3.9 MEAT REEFER ROOM (D-110)

Utilized by the ship's crew as a workshop and a storage area, this space is in good structural and fair cosmetic condition.

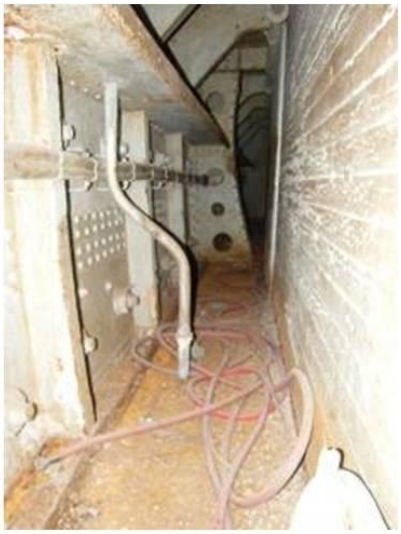

Figure 248 Area Outside Meat Reefer Room (Against Skin of Ship to Port)

Prepare, prime and paint space.

11 HALF DECK AFT

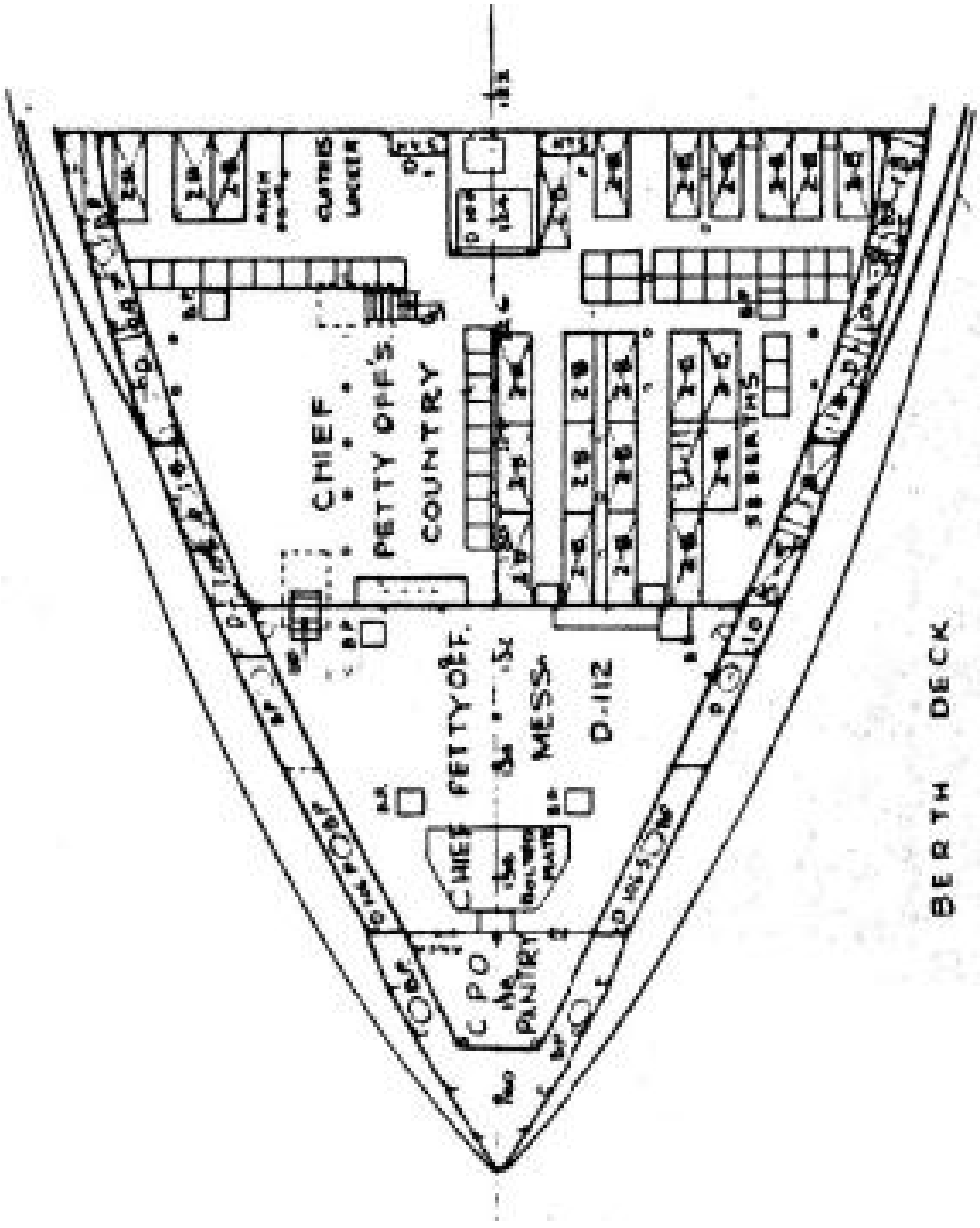

Figure 249 Layout of Half Deck Aft

11.1 CHIEF PETTY OFFICER'S (CPO) COUNTRY/BERTHING

This space is in poor structural and poor cosmetic condition. There is a large amount of rust/scale with a failed paint system.

Structure has failed in that the deck is very thin; outboard tankage has failed with wasted structural scantlings. Inboard vertical stanchions have wasted pedestals and are bending under the load stresses exerted from the spaces above (see Figure 250 and Figure 251).

Figure 250 CPO Country/Berthing (Looking Forward and Showing Bent Structural Stanchions)

Figure 251 Wasted Tank Top in CPO Berthing

Repair/replace deck as needed to maintain structural integrity with bulkhead and other scantlings.

Repair/replace vertical stanchions and stanchion pedestal bases as needed to ensure proper support of upper deck.

Repair/replace lower 4' of transverse bulkhead fore and aft

Prepare, prime and paint space.

11.2 CPO MESS

This space is in poor structural and poor cosmetic condition. Rust/scale abounds with a failed paint system.

Structure has failed in that the deck is very thin; outboard tankage has failed with wasted structural scantlings. Inboard vertical stanchions have wasted pedestals and are bending under the load stresses exerted from the spaces above

Transverse bulkheads (fore and aft) have failed and are rusted through.

The deck is paper thin (or failed outright) throughout and needs to be replaced as a safety and structural issue. The hatches leading to the pair of voids below have wasted frames/foundations and need to be replaced.

Figure 252 Wasted Tank Top (Left Panel) and Wasted Stanchions (Right Panel; Looking to Starboard) in CPO Mess

Figure 253 Wasted Tankage at Deck Line in CPO Mess

Repair/replace deck as needed to maintain structural integrity with bulkhead and other scantlings. Repair outboard tankage as needed to ensure watertight integrity.

Repair/replace vertical stanchions and stanchion pedestal bases as needed to ensure proper support of upper deck.

Repair/replace lower 4' of transverse bulkhead fore and aft.

Prepare, prime and paint space.

11.3CPO PANTRY

Continuing a theme from the previous two spaces on this deck, this space is in poor structural and poor cosmetic condition. Rust/scale abounds with a failed paint system.

Structure has failed in that the deck is very thin; outboard tankage has failed with wasted structural scantlings. Inboard vertical stanchions have wasted pedestals and are bending under the load stresses exerted from the spaces above

Transverse bulkheads (fore and aft) have failed and are rusted through.

The deck is paper thin (or failed outright) throughout and needs to be replaced as a safety and structural issue. The hatches leading to the pair of voids below have wasted frames/foundations and need to be replaced.

Figure 254 Wasted Tank Tops in CPO Pantry

Figure 255 Wasted Pedestal for Structural Scantling in CPO Pantry (Note Wasted Tank Top Vertical Plating in Background)

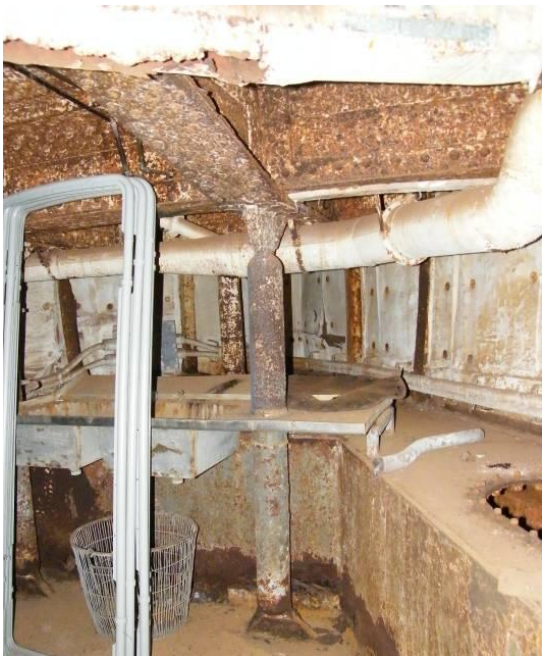

Figure 256 Looking Aft in CPO Pantry (Notice Stanchions Supporting Heavy Structural Members of Second Deck Above)

Repair/replace deck as needed to maintain structural integrity with bulkhead and other scantlings. Repair outboard tankage as needed to ensure watertight integrity.

Repair/replace vertical stanchions and stanchion pedestal bases as needed to ensure proper support of upper deck. Repair/replace lower 4' of transverse bulkhead fore and aft.

Prepare, prime and paint space.

12 FIRST PLATFORM

12.1 STEM TO FRAME No. 47

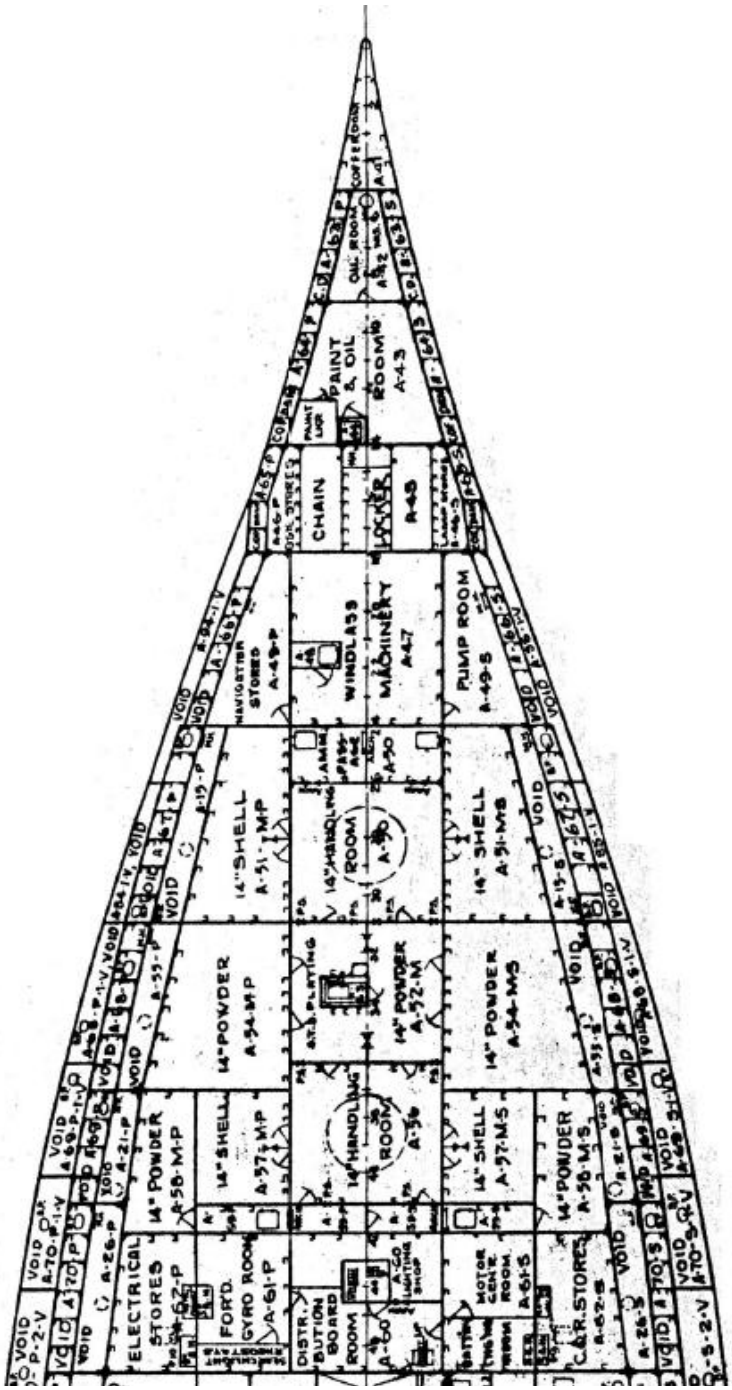

Figure 257 Layout of First Platform (Stem to Frame No. 47)

12.1.1 OIL ROOM (A-42, FRAMES No. 5 – 9)

This space is in good structural and fair cosmetic condition

Figure 258 Oil Room (A-42, Frames No. 5 – 9)

Prepare, prime and paint space.

12.1.2 PAINT & OIL ROOM (A-43, FRAMES No. 9 – 14)

This space is in good structural and fair cosmetic condition.

Figure 259 Paint and Oil Room (A-43, Frames No. 9 - 14)

Prepare, prime and paint space.

12.1.3 WINDLASS MACHINERY ROOM (A-47, FRAMES No. 14 – 24)

This space is in good structural and fair cosmetic condition.

Figure 260 Windlass Machinery Room (A-47, Frames No. 14 – 24)

Prepare, prime and paint space.

12.1.4 NAVIGATION STORES (A-49P)

This space is in good structural and fair cosmetic condition.

Figure 261 Navigation Stores (A – 49P)

Prepare, prime and paint space.

12.1.5 PUMP ROOM (A-49S)

This space is in good structural and fair cosmetic condition.

Figure 262 Pump Room (A – 49S)

Prepare, prime and paint space.

12.1.6 HANDLING ROOM (A-50)

This space is in good structural and fair cosmetic condition.

Figure 263 Handling Room (A – 50)

Prepare, prime and paint space.

12.1.7 14" SHELL MAGAZINE (A-51 MP, PORT)

This space is in good structural and fair cosmetic condition.

Figure 264 14" Shell Magazine (A – 51 MP; Port)

Prepare, prime and paint space.

12.1.8 14" SHELL MAGAZINE (A-51 MS, STARBOARD)

This space is in good structural and fair cosmetic condition.

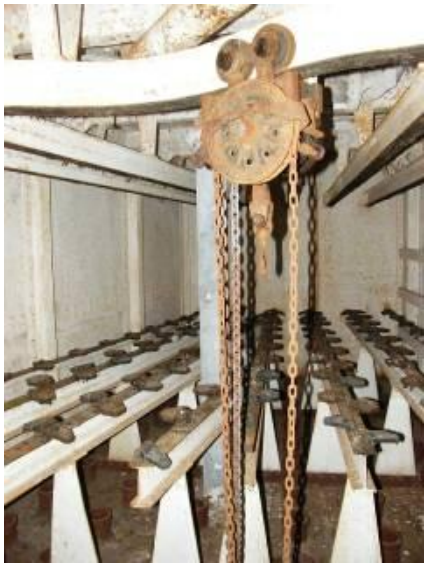

Figure 265 14" Shell Magazine (A – 51 MS; Starboard)

Prepare, prime and paint space.

12.1.9 14" POWDER MAGAZINE (A-52M, CENTERLINE)

This space is in good structural and fair cosmetic condition.

Figure 266 14" Powder Magazine (A – 52M; Centerline)

Prepare, prime and paint space.

12.1.10 14" POWDER MAGAZINE (A-54 MP, PORT)

This space is in good structural and fair cosmetic condition.

Figure 267 14" Powder Magazine (A – 54 MP; Port)

Prepare, prime and paint space.

12.1.11 14" POWDER MAGAZINE (A-54 MS)

This space is in good structural and fair cosmetic condition.

Figure 268 14" Powder Magazine (A – 54 MS)

Prepare, prime and paint space.

12.1.12 14" HANDLING ROOM (A-56, CENTERLINE)

This space is in good structural and fair cosmetic condition

Figure 269 14" Handling Room (A – 56; Centerline)

Prepare, prime and paint space.

12.1.13 14" SHELL MAGAZINE (A-57MP, PORT)

This space is in good structural and fair cosmetic condition.

Figure 270 14" Shell Magazine (A – 57 MP; Port)

Prepare, prime and paint space.

12.1.14 14" SHELL MAGAZINE (A-57MS, STARBOARD)

This space is in good structural and fair cosmetic condition.

Figure 271 14" Shell Magazine (A – 57 MS; Starboard)

Prepare, prime and paint space.

12.1.15 14" POWDER ROOM (A-58MP, PORT)

This space is in good structural and fair cosmetic condition.

Figure 272 14" Powder Room (A – 58 MP; Port)

Prepare, prime and paint space.

12.1.16 14" POWDER ROOM (A-58 MS, STARBOARD)

This space is in good structural and fair cosmetic condition.

Figure 273 14" Powder Room (A – 58 MS; Starboard)

Prepare, prime and paint space.

12.1.17 DISTRIBUTION ROOM (A-60, CENTERLINE)

This space is in good structural and fair cosmetic condition.

Figure 274 Distribution Room (A-60; Centerline)

Prepare, prime and paint space.

12.1.18 MOTOR GENERATOR ROOM (A-61S, STARBOARD)

This space is in good structural and fair cosmetic condition.

Figure 275 Motor Generator Room (A – 61S; Starboard)

Prepare, prime and paint space.

12.1.19 FORWARD GYRO ROOM (A-61P, PORT)

This space is in good structural and fair cosmetic condition. Gyro is missing.

Figure 276 Forward Gyro Room (A – 61P; Port)

Prepare, prime and paint space.

12.1.20 ELECTRICAL STORES (A-62P, PORT)

This space was not observed.

12.1.21 C & R STORES (A-62S, STARBOARD)

This space was not observed.

12.2 FRAMES No. 47 – 123

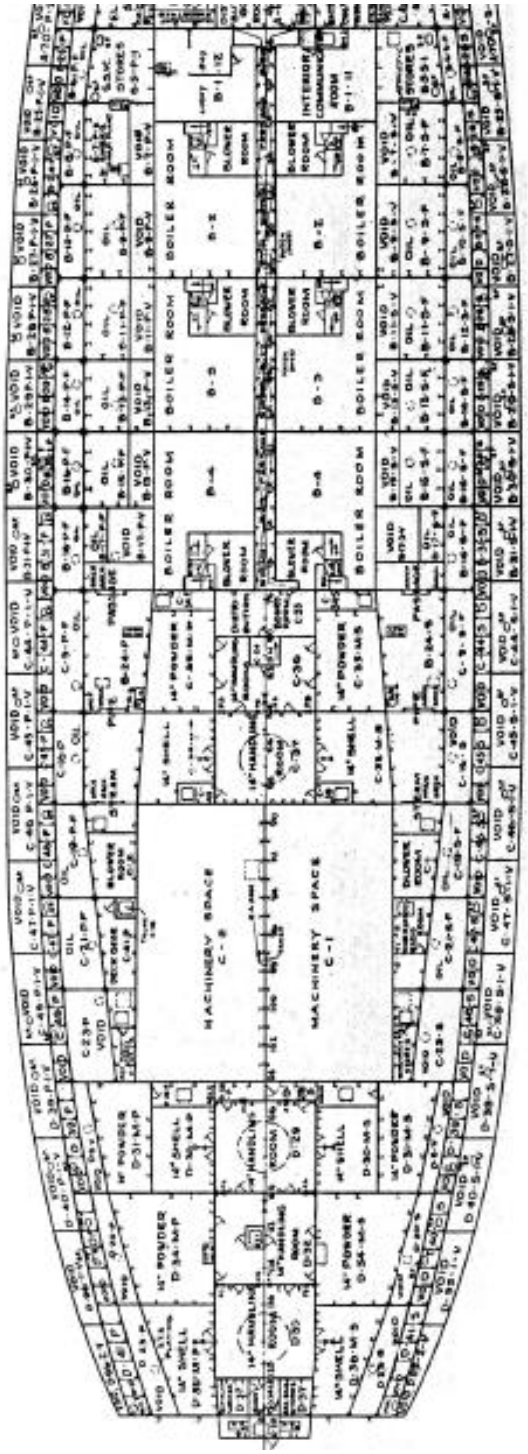

Figure 277 Layout of First Platform (Frames No. 47 – 123)

12.2.1 INTERIOR COMMUNICATIONS ROOM (B-1-11, FRAMES 47 – 52)

This space is in good structural and fair cosmetic condition. This space holds the interior communications power panels and switches.

Prepare, prime and paint space.

12.2.2 LUCKY BAG (B-1-12)

This space was not observed.

12.2.3 14" POWDER ROOM (C-35M-S, STARBOARD)

This space is in good structural and fair cosmetic condition. Cosmoline has been painted on powder chutes.

Figure 278 14" Powder Room (C-35 M-S; Starboard)

Prepare, prime and paint space.

12.2.4 14" POWDER ROOM (C-35M-P, PORT)

This space is in good structural and fair cosmetic condition. Cosmoline has been painted on powder chutes.

Figure 279 14" Powder Room (C-35 M-P; Port)

Prepare, prime and paint space.

12.2.5 14" HANDLING ROOM (C-36, CENTERLINE)

This space is in good structural and fair cosmetic condition. Cosmoline has been painted on powder chutes.

Figure 280 14" Handling Room (C-36; Centerline)

Prepare, prime and paint space.

12.2.6 14" HANDLING ROOM (C-37, CENTERLINE)

This space is in good structural and fair cosmetic condition. Cosmoline has been painted on powder chutes.

Figure 281 14" Handling Room (C-37; Centerline)

Prepare, prime and paint space.

12.2.7 14" SHELL MAGAZINE (C-38-M-P, PORT)

This space is in good structural and fair cosmetic condition.

Figure 282 14" Shell Magazine (C-38-M-P; Port)

Prepare, prime and paint space.

12.2.8 14" SHELL MAGAZINE (C-38-M-S, STARBOARD)

This space is in good structural and fair cosmetic condition

Figure 283 14" Shell Magazine (C-38 M-S; Starboard)

Prepare, prime and paint space.

12.2.9 14" HANDLING ROOM (D-29, CENTERLINE)

This space is in good structural and fair cosmetic condition.

Figure 284 14" Handling Room (D-29; Centerline)

Prepare, prime and paint space.

12.2.10 14" SHELL MAGAZINE (D-30-M-S, STARBOARD)

This space is in good structural and fair cosmetic condition.

Figure 285 14" Shell Magazine (D-30-M-S; Starboard)

Prepare, prime and paint space.

12.2.11 POWDER MAGAZINE (D-31-M-S, STARBOARD)

This space is in good structural and fair cosmetic condition.

Prepare, prime and paint space.

12.2.12 14" SHELL MAGAZINE (D-30-M-P, PORT)

This space is in good structural and fair cosmetic condition.

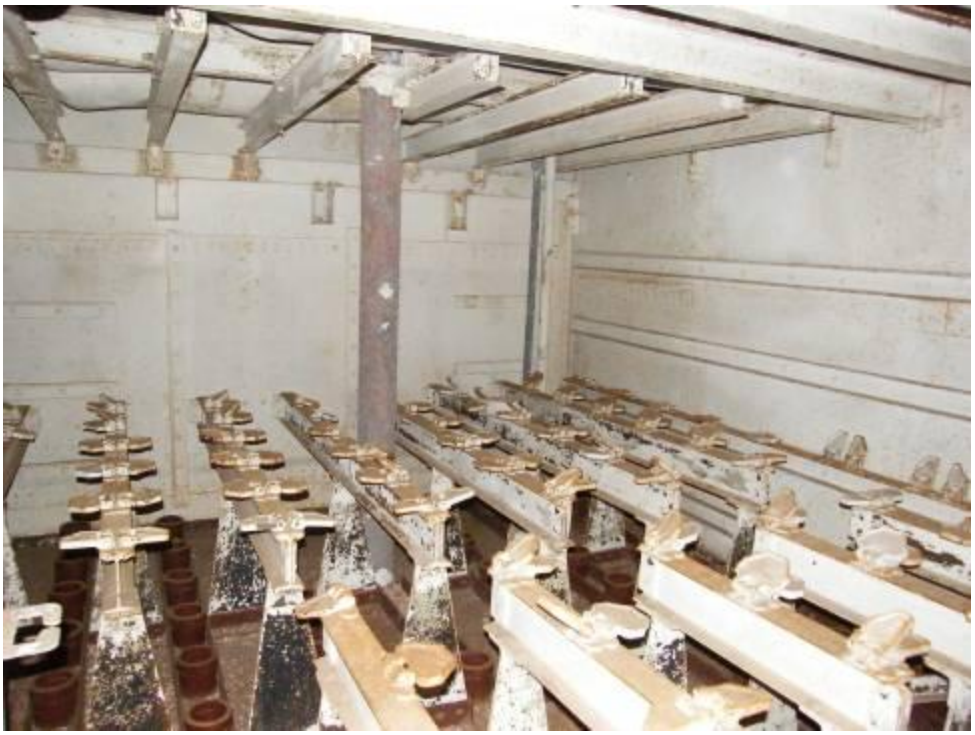

Figure 286 14" Shell Magazine (D-30-M-P; Port)

Prepare, prime and paint space.

12.2.13 14" POWDER MAGAZINE (D-31-M-P. PORT)

This space is in good structural and fair cosmetic condition.

Prepare, prime and paint space.

12.2.14 14" HANDLING ROOM (D-32 CENTERLINE)

This space is in fair/good structural and fair cosmetic condition. The deck is holed on the starboard side aft adjacent to dogging hatch.

Figure 287 14" Handling Room (D-32; Centerline)

Repair/replace thin deck adjacent to aft bulkhead and dogging hatch.
Prepare, prime and paint space.

12.2.15 14" POWDER MAGAZINE (D-34-M-S, STARBOARD)

This space is in good structural and fair cosmetic condition

Figure 288 14" Powder Magazine (D-34-M-S; Starboard)

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Prepare, prime and paint space.

12.2.16 14" POWDER MAGAZINE (D-34-M-P, PORT)

This space is in good structural and fair cosmetic condition.

Figure 289 14" Powder Magazine Room (D-34-M-P; Port)

Prepare, prime and paint space.

12.2.17 14" HANDLING ROOM (D-35, CENTERLINE)

This space is in good structural and fair cosmetic condition.

Figure 290 14" Handling Room (D-35; Centerline)

Prepare, prime and paint space.

12.2.18 14" SHELL MAGAZINE (D-36-M-S, STARBOARD)

This space is in good structural and fair cosmetic condition.

Figure 291 14" Shell Magazine (D-36-M-S; Starboard)

Prepare, prime and paint space.

12.2.19 14" SHELL MAGAZINE (D-36-M-P, PORT)

This space is in good structural and fair cosmetic condition.

Prepare, prime and paint space.

12.2.20 PASSAGEWAY (D-38, CENTERLINE)

This space is in poor structural and fair cosmetic condition. Entire deck is holed and badly corroded.

Figure 292 Passageway (D-38; Centerline)

Repair deck as needed.

Prepare, prime and paint space.

12.2.21 STOREROOMS (D-37, PORT & STARBOARD)

These spaces are in poor structural and fair cosmetic condition. Entire deck is holed and badly corroded.

Figure 293 Storerooms (D-37) Port (Left Panel) and Starboard (Right Panel)

Repair deck as needed.

Prepare, prime and paint space.

13 SECOND PLATFORM

13.1 STEM TO FRAME No. 52

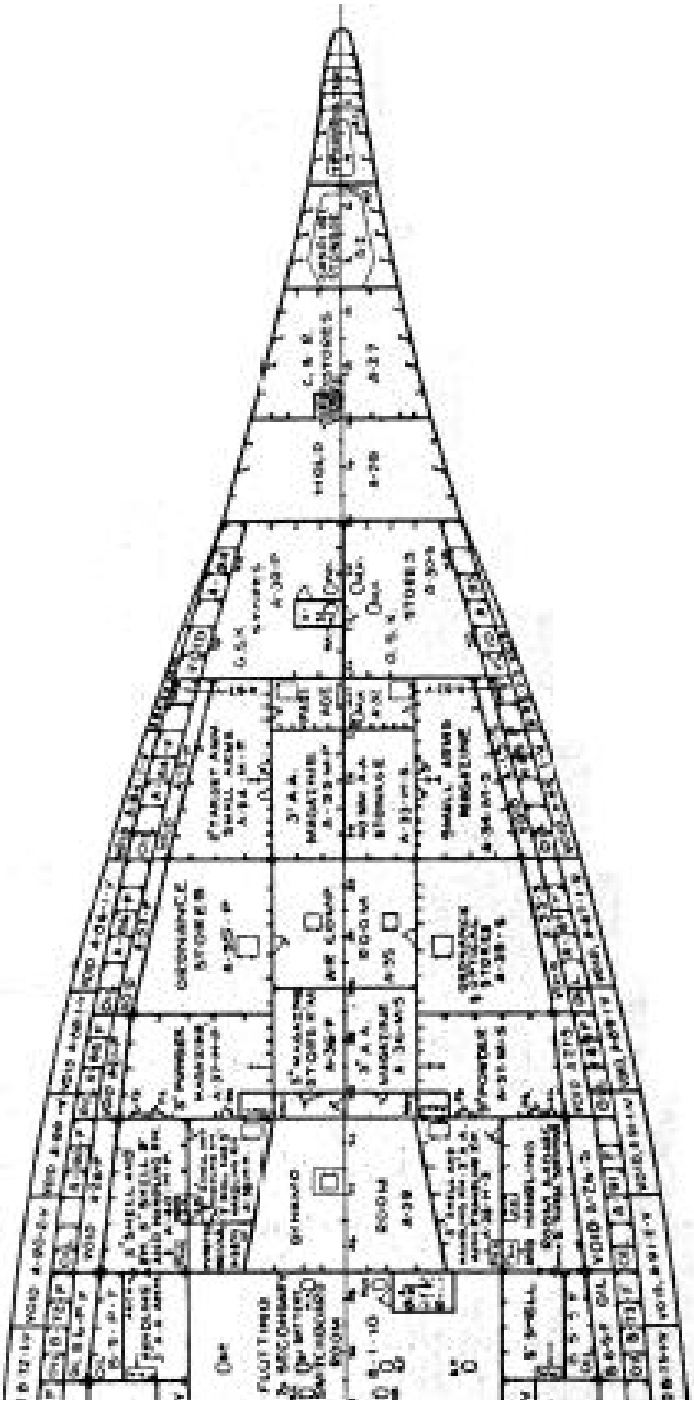


Figure 294 Layout of Second Platform (Stem to Frame No. 52)

13.1.1 C & R STORES (C-27, FRAMES No. 9 – 14)

This space is in fair structural and fair cosmetic condition. The entire deck is holed and badly corroded.

Figure 295 C&R Stores (C - 27; Frames No. 9 – 14)

Repair deck as needed.
Prepare, prime and paint space.

13.1.2 HOLD (A-29, FRAMES No. 14 – 18)

This space is in good structural and fair cosmetic condition.

Figure 296 Hold (A – 29, Frames No. 14 – 18)

Prepare, prime and paint space.

13.1.3 GSK STORES (A-30-P, PORT, FRAMES No. 18 – 24)

This space is in good structural and fair cosmetic condition.

Figure 297 GSK Stores (A – 30 – P, Frames No. 18 – 24; Port)

Prepare, prime and paint space.

13.1.4 GSK STORES (A-30-S, STARBOARD, FRAMES No. 18 – 24)

This space is in good structural and fair cosmetic condition.

Figure 298 GSK Stores (A-30-S, Frames No. 18 – 24; Starboard)

Prepare, prime and paint space.

13.1.5 3" MAGAZINE (A-34-M-P, PORT)

This space is in good structural and fair cosmetic condition

Figure 299 3" Magazine (A-34-M-P; Port)

Prepare, prime and paint space.

13.1.6 SMALL ARMS MAGAZINE (A-34-M-S, STARBOARD)

This space is in good structural and fair cosmetic condition.

Figure 300 Small Arms Magazine (A-34-M-S; Starboard)

Prepare, prime and paint space.

13.1.7 3" A.A. MAGAZINE (A-33-M-P, PORT)

This space is in good structural and fair cosmetic condition.

Figure 301 3" A.A. Magazine (A-33-M-P; Port)

Prepare, prime and paint space.

13.1.8 40 MM A.A. STORAGE MAGAZINE (A-33-M-S, STARBOARD)

This space is in good structural and fair cosmetic condition.

Figure 302 40 MM A.A. Storage Magazine (A-33-M-S; Starboard)

Prepare, prime and paint space.

13.1.9 AIR COMPRESSOR ROOM (A-35)

This space is in good structural and fair cosmetic condition.

Prepare, prime and paint space.

13.1.10 ORDNANCE & OPTICAL STOREROOM (A-35-S, STARBOARD)

This space is in good structural and fair cosmetic condition.

Prepare, prime and paint space.

13.1.11 ORDNANCE STOREROOM (A-35-P, PORT)

This space is in good structural and fair cosmetic condition.

Figure 303 Ordnance Storeroom (A-35-P; Port)

Prepare, prime and paint space.

13.1.12 3" MAGAZINE STORES (A-36-P, PORT)

This space is in good structural and fair cosmetic condition.

Figure 304 3" Magazine (A-36-P; Port)

Prepare, prime and paint space.

13.1.13 5” POWDER MAGAZINE (A-37-M-P, PORT)

This space is in good structural and fair cosmetic condition.

Prepare, prime and paint space.

13.1.14 5” POWDER MAGAZINE (A-37-M-S, STARBOARD)

This space is in good structural and fair cosmetic condition.

Prepare, prime and paint space.

13.1.15 FORWARD DYNAMO ROOM (A-39, CENTERLINE)

This space is in good structural and fair cosmetic condition.

Figure 305 Forward Dynamo Room (A-39; Centerline)

Prepare, prime and paint space.

13.1.16 3” SHELL & HANDLING ROOM (A-38-M-P, PORT)

This space is in good structural and fair cosmetic condition.

Figure 306 3” Shell and Handling Room (A-38-M-P; Port)

Prepare, prime and paint space.

13.1.17 5” SHELL & HANDLING ROOM (A-38-M-S, STARBOARD)

This space is in good structural and fair cosmetic condition.

Figure 307 5” Shell and Handling Room (A-38-M-S; Starboard)

Prepare, prime and paint space.

13.1.18 5” SHELL & HANDLING ROOM (A-40-M-P, PORT)

This space is in good structural and fair cosmetic condition.

Figure 308 5" Shell and Handling Room (A-40-M-P; Port)

Prepare, prime and paint space.

13.1.19 5" SHELL & HANDLING ROOM (A-38-M-S, STARBOARD)

This space is in fair structural and poor cosmetic condition.

Figure 309 5" Shell and Handling Room (A-38-M-S; Starboard)

Prepare, prime and paint space.

13.1.20 PLOTTING & SECONDARY CONNING STATION (B-1-10)

This space is in good structural and cosmetic condition. Much equipment has been removed from this public access space.

Figure 310 Plotting and Secondary Conning Station (B-1-10)

Prepare, prime and paint space.

13.2 FRAMES No. 52 to 89

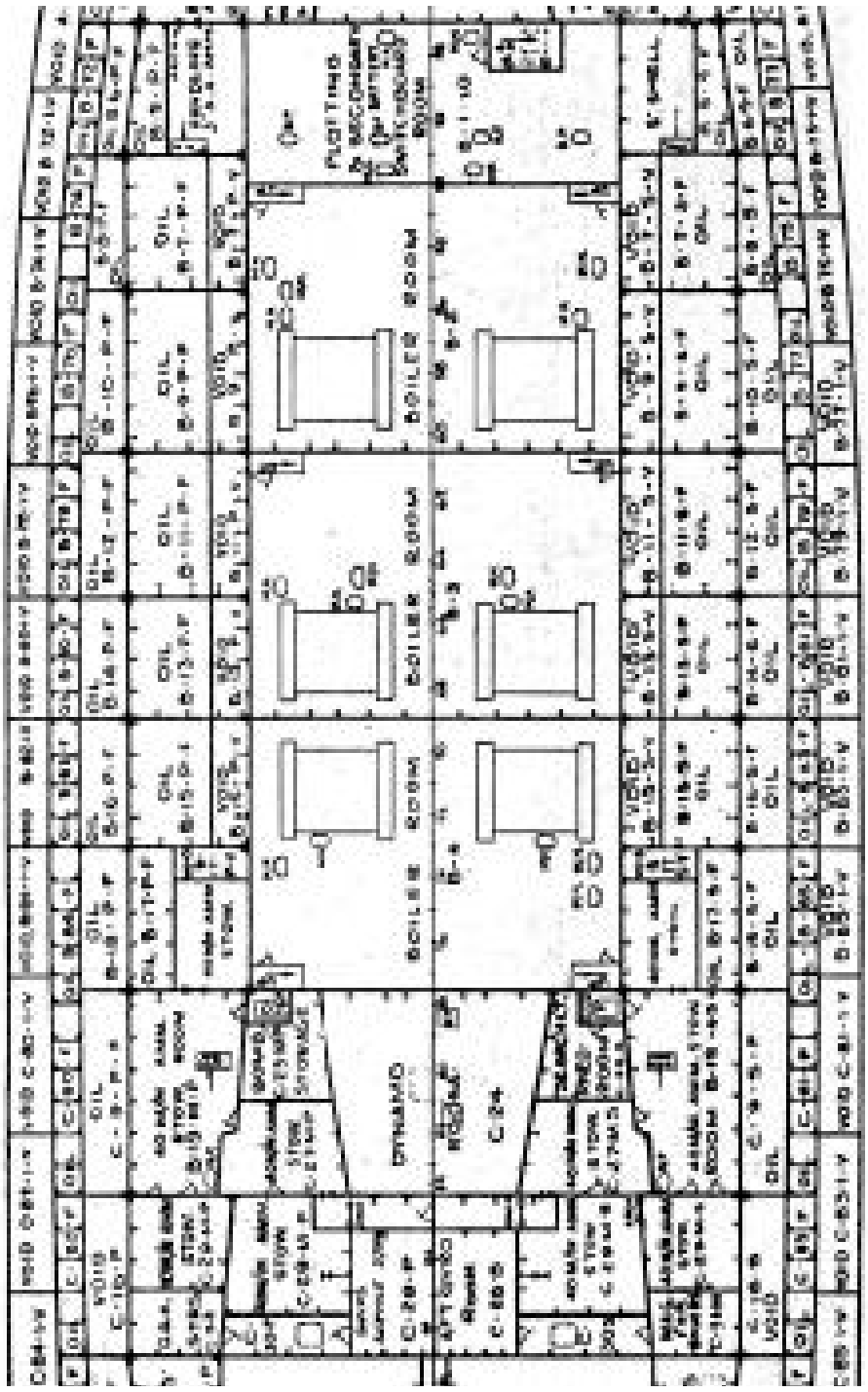


Figure 311 Layout of Second Platform (Frames No. 52 – 89)

13.2.1 B-2 BOILER ROOM (FRAMES No. 52 – 60 ½)

Two boilers are located on the aft side of this boiler room with the lower flat supporting a steel grating for crew access and associated plumbing, steam, fuel and feed water equipment and manifolds as original to the 1925-1926 fuel oil conversion.

The appearance of the boiler room is of a space that has not seen much upkeep since decommissioning with dried oil on many components, but no standing oil in the bilges. The paint system is failing throughout the space. Lighting could be vastly improved. The upper access ladder well has unsafe deck plating that should be repaired/replaced.

The foundations for the pair of boilers and the other major components within the boiler room are good with no signs of badly scaled or compressed plating and foundations.

The floor for these boilers and the other major components is wasted approximately 30% in places, but is not considered a problem at this time. Side shell on both sides appears fine with no leakage from outboard tankage, piping or manifolds.

Figure 312 B-2 Boiler Room (Frames No. 52 – 60 ½)

Inspect, repair/replace vertical stanchions supporting the deck gratings throughout the entire boiler room.

Repair/replace ladder well deck on both sides; repair ladders and handrails as needed; this is a serious trip/fall hazard.

Improve space lighting throughout boiler room.

Remediate standing oil on components and vacate piping/manifolds of fuel oil as needed.

Prepare, prime and paint space.

13.2.2 B-3 BOILER ROOM (FRAMES No. 60 ½ - 69)

Two boilers are located on the aft side of this boiler room with the lower flat supporting a steel grating for crew access and associated plumbing, steam, fuel and feed water equipment and manifolds as original to the 1925-1926 fuel oil conversion.

The appearance of the boiler room is of a space that has seen much upkeep since decommissioning with additional lighting fitted, work benches established and the restoration of boilers and associated machinery. There is dried oil on many components, and minor amounts of standing oil in the bilges. The paint system is failing throughout the space, although restorers are making great headway with ongoing preservation of piping systems and other components. Lighting has been vastly improved. Both upper access ladder wells have unsafe deck plating that should be repaired/replaced. With the ongoing restoration, crew members should be made cognizant of related structural deficiencies within this space as spelled out below.

The foundations for the pair of boilers within the boiler room are starting to fail with signs of badly scaled or compressed plating and foundations.

The floor for these boilers is completely wasted through in many areas allowing views within the underlying hold tankage with approximately additional 40 – 70 % wastage in places. The underlying support frames and longitudinal within the tankage in the hold and inner bottom is severely bent, totally wasted away or non-existent and showing ready signs of eventual collapse. The side shell on both sides appears fine with no leakage from outboard tankage, piping or manifolds.

Figure 313 Wasted Flooring in Boiler Room B-3

Figure 314 Wasted Vertical Stanchion (Left) and Foundation Plating (Right) in B-3 Boiler Room

Inspect, repair/replace vertical stanchions supporting the deck gratings throughout the entire boiler room.

Repair/replace ladder well deck on both sides; repair ladders and handrails as needed; this is a serious trip/fall hazard.

Repair/replace boiler room deck plating and repair/replace wasted foundation footings on boilers and major components as needed to stabilize hull integrity.

Remediate standing oil on components and vacate piping/manifolds of fuel oil as needed.

Prepare, prime and paint space.

13.2.3 B-4 BOILER ROOM (FRAMES No. 69 – 77 ½)

Two boilers are located on the forward side of this boiler room with the lower flat supporting a steel grating for crew access and associated plumbing, steam, fuel and feed water equipment and manifolds as original to the 1925-1926 fuel oil conversion.

The appearance of the boiler room is of a space that has not seen much upkeep since decommissioning with dried oil on many components, and minor amounts of standing oil in the bilges. The paint system is failing throughout the space. Lighting could be vastly improved; although TPWD has made some improvements, lighting could not be turned on at time of inspection. Both upper access ladders wells have unsafe deck plating that should be repaired/replaced.

The foundations for the pair of boilers within the boiler room are starting to fail with signs of badly scaled or compressed plating and foundations.

The floor for these boilers is completely wasted through in many areas allowing views within the underlying hold tankage with approximately additional 40 – 70 % wastage in places. The underlying support frames and longitudinal within the tankage in the hold and inner bottom is severely bent, totally wasted away or non-existent and showing ready signs of eventual collapse under both boilers. The side shell on both sides appears fine with no leakage from outboard tankage, piping or manifolds.

Figure 315 Boiler Room B-4

Figure 316 Standing Oil in Bilges of B-4 Boiler Room

Figure 317 Wasted Deck Plating in Front of Boiler in B-4 Boiler Room

Figure 318 Foundation of Boiler in B-4 Boiler Room (To Port)

Inspect, repair/replace vertical stanchions supporting the deck gratings throughout the entire boiler room.

Repair/replace ladder well deck on both sides; repair ladders and handrails as needed; this is a serious trip/fall hazard.

Repair/replace boiler room deck plating and repair/replace wasted foundation footings on boilers and major components as needed to stabilize hull integrity.

Improve space lighting throughout boiler room.

Remediate standing oil on components and vacate piping/manifolds of fuel oil as needed.

Prepare, prime and paint space.

13.2.4 AFT DYNAMO ROOM (C-24, FRAMES No. 77 ½ - 84 ½)

This space is in fair structural and poor cosmetic condition. The deck is weak in many areas and needs to be repaired. Poor air quality within this and lower spaces should be improved with adequate ventilation. Lighting is poor or non-existent.

Figure 319 Aft Dynamo Room (C-24, Frames No. 77 ½ - 84 ½)

Provide adequate ventilation to space(s)
Repair/replace deck as needed.
Prepare, prime and paint space.

13.2.5 AFT GYRO ROOM (C-28, FRAMES No. 84 ½ - 89)

This space is in fair structural and poor cosmetic condition. The deck is weak in many areas and needs to be repaired. Poor air quality within this and lower spaces should be improved with adequate ventilation. Lighting is poor or non-existent.

Figure 320 Aft Dynamo Room (C-28, Frames No. 84 ½ - 9)

Provide adequate ventilation to space(s)
Repair/replace deck as needed.
Prepare, prime and paint space.

13.2.6 40 MM MAGAZINE (B-19-A-S, STARBOARD)

This space is in good structural and fair cosmetic condition.

Prepare, prime and paint space.

13.2.7 40 MM MAGAZINE (C-29-M-S, STARBOARD)

This space is in good structural and fair cosmetic condition.

Prepare, prime and paint space.

13.2.8 BOMB MAGAZINE (C-31M, STARBOARD)

This space is in good structural and fair cosmetic condition.

Prepare, prime and paint space.

13.2.9 40 MM MAGAZINE (C-29M-S, STARBOARD)

This space is in good structural and fair cosmetic condition.

Prepare, prime and paint space.

13.2.10 SHIP SERVICE STORES (C-28P, PORT)

This space is in good structural and fair cosmetic condition.

Prepare, prime and paint space.

13.2.11 BOMB MAGAZINE (C-25M-P, PORT)

This space is in good structural and fair cosmetic condition.

Prepare, prime and paint space.

13.2.12 40 MM MAGAZINE (C-27-M-P, PORT)

This space is in good structural and fair cosmetic condition.

Prepare, prime and paint space.

13.2.13 40 MM MAGAZINE (B-19M-P, PORT)

This space is in good structural and fair cosmetic condition.

Prepare, prime and paint space.

13.2.14 40 MM MAGAZINE (C-29M-P, PORT)

This space is in good structural and fair cosmetic condition.

Prepare, prime and paint space.

13.2.15 GSK STORES (C-32)

This space is in good structural and fair cosmetic condition.

Prepare, prime and paint space.

13.3 FRAME 104 TO STERN

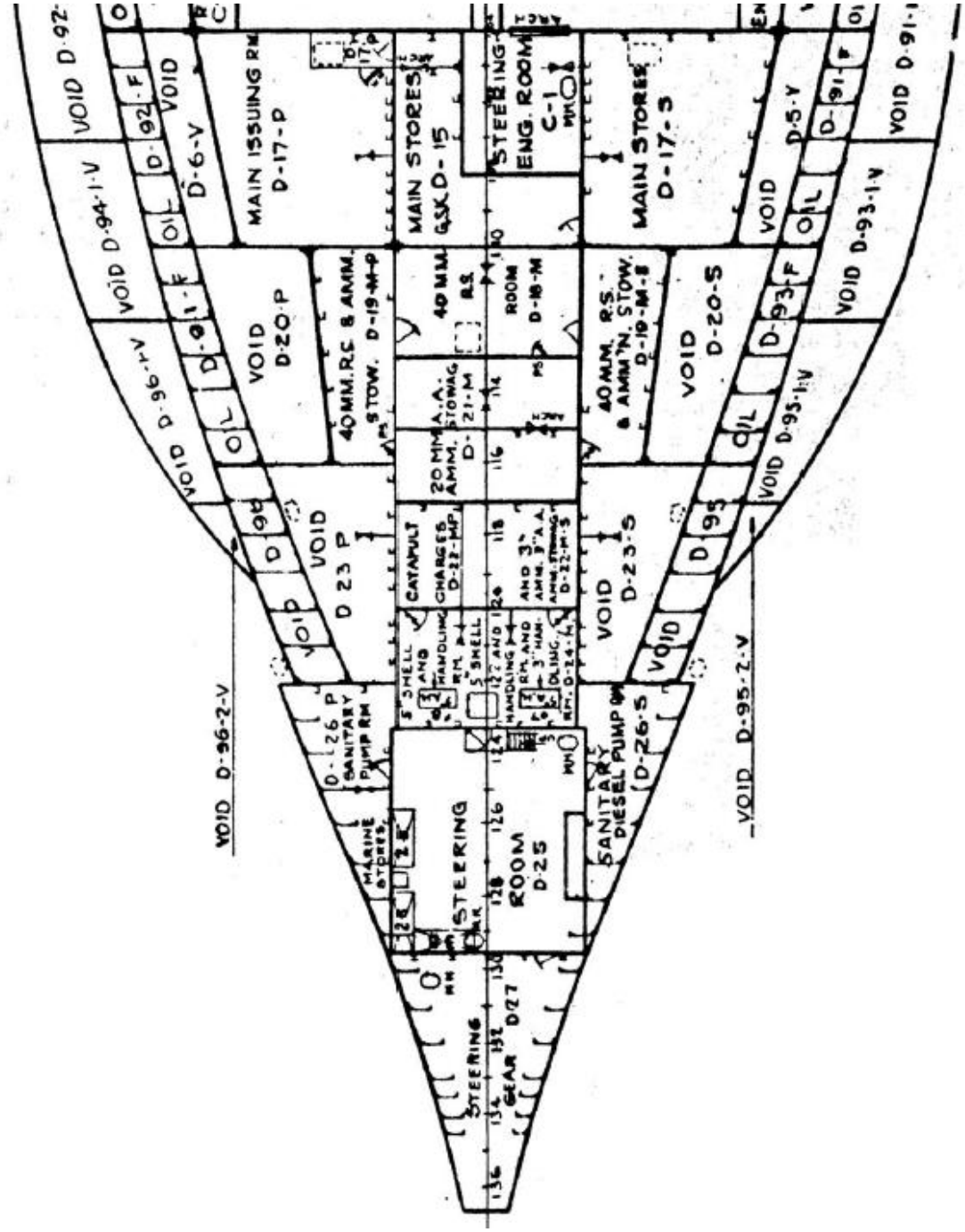


Figure 321 Layout of Second Platform (Frames No. 104 to Stern)

13.3.1 STEERING ENGINE ROOM (C-1, CENTERLINE)

This space is in good structural and poor cosmetic condition.

Prepare, prime and paint space.

13.3.2 G.S.K. STORES (D-15, CENTERLINE)

This space is in good structural and poor cosmetic condition. Miscellaneous gear is strewn about space.

Figure 322 G.S.K. Stores (D-15; Centerline)

Prepare, prime and paint space.

13.3.3 MAIN ISSUING ROOM (D-17, PORT)

This space is in good structural and poor cosmetic condition.

Figure 323 Main Issuing Room (D-17; Port)

Prepare, prime and paint space.

13.3.4 MAIN STORES (D-17S, STARBOARD)

This space is in fair structural and poor cosmetic condition. The bulkhead is severely wasted and

cracked where it meets the deck.

Figure 324 Main Stores (D-17S; Starboard) Showing Heavily Wasted and Cracked Bulkhead Where it Meets Deck (Right Panel)

Repair wasted bulkhead where it meets deck.
Prepare, prime and paint space.

13.3.5 40 MM READY SERVICE ROOM (D-18-M, CENTERLINE)

This space is in good structural and good cosmetic condition.

Figure 325 40 MM Ready Service Room (D-18-M; Centerline)

Prepare, prime and paint space.

13.3.6 20 MM MAGAZINE (D-21M, CENTERLINE)

This space is in good structural and good cosmetic condition.

Figure 326 20 MM Magazine (D-21M; Centerline)

Prepare, prime and paint space.

13.3.7 40 MM MAGAZINE (D-19-M-P, PORT)

This space is in good structural and poor cosmetic condition with standing oil and water on deck.

Figure 327 40 MM Magazine (D-19-M-P; Port)

Remediate oil/water in space. Find cause and seal.
Prepare, prime and paint space.

13.3.8 SANITARY PUMP ROOM (D-20-P, PORT)

This space is in poor structural and poor cosmetic condition. The main web frames are badly wasted; likewise the fore and aft bulkhead are non-watertight with standing oil and water on deck. This space has had leaking plating in the past and is cause for concern given that there is wetness observed in bilge pockets.

Figure 328 Wasted Floor (Left Panel) and Standing Water in Bilge Pockets (Right Panel) in Sanitary Pump Room (D-20-P; Port)

Repair frames and bulkheads as needed to ensure watertight integrity.

Remediate oil/water in space. Find cause and seal.

Prepare, prime and paint space.

13.3.9 VOID (D-20-S, STARBOARD)

This space was not observed. The condition of this space is likely to be similar to that of "D-20-P".

13.3.10 20 MM MAGAZINE (D-21M, CENTERLINE)

This space is in poor structural and poor cosmetic condition. The deck is in very poor condition and is unsafe for entry.

Repair deck in space as needed.

Prepare, prime and paint space.

13.3.11 CATAPAULT CHARGES ROOMS (D-22M-P & D-22M-S)

This space is in poor structural and poor cosmetic condition. The deck is in very poor condition and is unsafe for entry.

Repair deck in space as needed.

Prepare, prime and paint space.

13.3.12 3" SHELL HANDLING HOIST ROOM (D-24M, CENTERLINE)

This space is in poor structural and poor cosmetic condition. The deck is in very poor condition and is unsafe for entry.

Repair deck in space as needed.

Prepare, prime and paint space.

13.3.13 STEERING ROOM (D-25, CENTERLINE)

This space contains the main electrical and hydraulic control equipment powering the steering rams in the next space aft. An antique quad of wooden steering wheels are fitted, but are no longer attached to the steering assembly linkage.

This space has a badly corroded deck that needs repair; inspection by gauging showed wastage greater than 60-70% over a wide area. The overhead sheathing, support framing, bulkheads and vertical stanchions supporting the turtleback on the overhead sheathing have failed, or are soon to fail, due to corrosion. The deck itself is poorly supported by the transverse frames and stanchions within the Trimming Tank D-12. This entire area needs to be rebuilt to withstand the movement of the ship and to impart any strength while on the keel blocks to support everything under the Third Deck.

Figure 329 Steering Room (D-25; Centerline)

Repair deck in space as needed.

Repair bulkheads (fore and aft) mainly at deckline as needed.

Prepare, prime and paint space.

13.3.14 SANITARY DIESEL PUMP ROOM (D-26S, STARBOARD)

This space has a badly corroded deck that needs repair; inspection by gauging showed wastage greater than 60-70% over a wide area and holed plating. The overhead sheathing, support framing, bulkheads and vertical stanchions supporting the turtleback on the overhead sheathing have failed, or are soon to fail, due to corrosion. The outboard plating has badly deteriorated and will require repairs. The deck itself is poorly supported by the transverse frames and stanchions within the Trimming Tank D-12. There is not much here supporting the entire structure on the starboard quarter.

Figure 330 Sanitary Diesel Pump Room (D-26S; Starboard)

Repair deck, framing and shell plating in space as needed.

Repair bulkheads (fore and aft) mainly at deckline as needed.

Prepare, prime and paint space.

13.3.15 SANITARY PUMP ROOM & STORES (D-26P, PORT)

This space has a badly corroded deck that needs repair; inspection by gauging showed wastage greater than 60-70% over a wide area and holed plating. The overhead sheathing, support framing, bulkheads and vertical stanchions supporting the turtleback on the overhead sheathing have failed, or are soon to fail, due to corrosion. The outboard plating has badly deteriorated and will require repairs. The deck itself is poorly supported by the transverse frames and stanchions within the Trimming Tank D-12. There is not much here supporting the entire structure on the port quarter.

Figure 331 Sanitary Pump Room (D-26P; Port) Showing Wasted Plating in Right Panel

Repair deck and framing in space as needed.

Repair bulkheads (fore and aft) mainly at deckline as needed.

Prepare, prime and paint space.

13.3.16 STEERING ROOM (D-27)

This space contains the extremely heavy pair of hydraulic rams connected to the rudder post that steers the ship; these are very robust and locked in position to a 15 degree starboard turn. The condition of the space is poor structurally and poor cosmetically. The deck is wasted and holed, and is very dangerous.

Transverse web frames have failed entirely. The overhead is hanging over this space without much support. Outboard plating is in poor condition throughout. The deck frames and stanchions (themselves holed and badly wasted) supporting the heavy steering gear are badly corroded and rest on a badly corroded keel within Trimming Tank D-13. This entire area needs to be rebuilt to withstand the movement of the ship and to impart any strength while on the keel blocks to support everything under the Third Deck.

Figure 332 View of Steering Room (D-27)

Figure 333 Detail of Steering Rams at Crosshead Showing Waster Overhead Shell Plating of Turtleback Enclosure

Figure 334 Wasted Transverse Web Frames and Deck Plating in Steering Room (D-27)

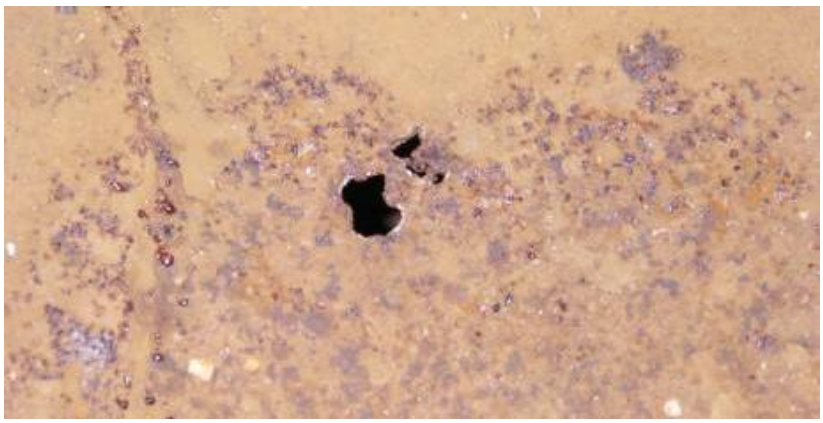


Figure 335 Holed Deck Plating in Steering Room (D-27)

Repair/replace existing transverse web frames as needed.

Repair deck in space as needed.

Repair bulkheads (fore and aft) mainly at deckline as needed.

Prepare, prime and paint space.

13.3.17 VOID D-101, VOID D-102 & VOID D-103 OVER STEERING FLAT TURTLE BACK

These spaces are accessed via a hatch in the CPO quarters. The condition of all three spaces are poor structurally and poor cosmetically. The deck is unsafe throughout. The vertical stanchions supporting the Third Deck are wasted throughout and are in danger of failure.

The aft bulkhead in D-103 is holed and is totally wasted. Transverse framing outboard and under the deck is soon to fail as it is in badly corroded condition, and so is the overhead deck.

This entire area needs to be rebuilt to withstand the movement of the ship and to impart any strength while on the keel blocks to support everything under the Third Deck.

Photographs were not taken as the inspection team was pulled out of the space(s) due to poor and dangerous structural conditions observed.

Rebuild entire area (deck, stanchions, aft bulkhead, transverse framing etc.) to withstand movement of ship

Do not allow personnel in this area as it is prone to failure

Prepare, prime and paint space

14 HOLD

14.1 STEM TO FRAME No. 47 ½

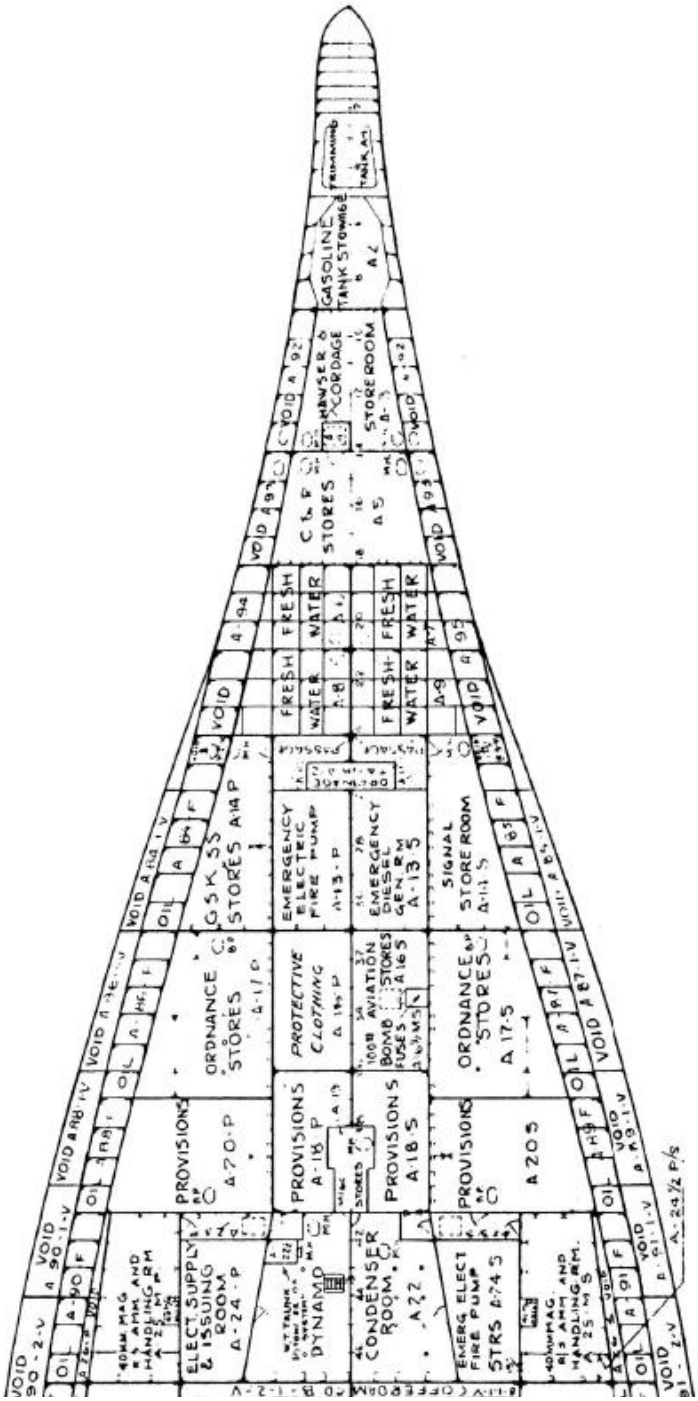


Figure 336 Layout of Hold (Stem to Frame No. 47 ½)

14.1.1 HAWSE & CORDAGE STOREROOM (A-3, FRAMES No. 9 – 14)

This space is in good structural and fair cosmetic condition.

Figure 337 Hawse and Cordage Storeroom (A-3, Frames No. 9 – 14)

Prepare, prime and paint space.

14.1.2 C & R STORES (A-5, FRAMES No. 14 – 18)

This space is in good structural and fair cosmetic condition.

Figure 338 C&R Stores (A-5, Frames No. 14 – 18)

Prepare, prime and paint space.

14.1.3 SIGNAL STOREROOM (A-14S, STARBOARD)

This space is in good structural and fair cosmetic condition.

Figure 339 Signal Storeroom (A-14S; Starboard)

Prepare, prime and paint space.

14.1.4 GSK STOREROOM (A-14P, PORT)

This space is in good structural and fair cosmetic condition.

Figure 340 GSK Storeroom (A-14 P; Port)

Prepare, prime and paint space.

14.1.5 EMERGENCY DIESEL ROOM (A-13 S, STARBOARD)

This space is in good structural and good cosmetic condition. The passageway just forward of this space has holed plating at the centerline. There is a bank of original CO-2 cylinders that should be carefully removed.

Figure 341 Emergency Diesel Room (A – 13 S; Starboard)

Figure 342 Holed Deck Plating in Passageway Forward of Forward Emergency Diesel Room (A – 13S; Starboard)

Remove CO-2 cylinders from this space and properly dispose.
Repair wasted passageway deck plating.
Remove CO-2 cylinders from space.
Prepare, prime and paint space.

14.1.6 PUMP ROOM (A-13P, PORT)

This space is in good structural and fair cosmetic condition.

Figure 343 Pump Room (A-13-P; Port)

Prepare, prime and paint space.

14.1.7 ORDNANCE STORES (A-17S, STARBOARD)

This space is in good structural and fair cosmetic condition.

Prepare, prime and paint space.

14.1.8 ORDNANCE STORES (A-17P, PORT)

This space is in good structural and fair cosmetic condition.

Prepare, prime and paint space.

14.1.9 PROTECTIVE CLOTHING ROOM (A-15P, CENTERLINE)

This space is in good structural and fair cosmetic condition.

Prepare, prime and paint space.

14.1.10 AVIATION BOMB FUSE ROOM (A-16S, STARBOARD)

This space is in good structural and fair cosmetic condition.

Prepare, prime and paint space.

14.1.11 PROVISIONS ROOM (A-19, CENTERLINE)

This space is in good structural and fair cosmetic condition.

Figure 344 Provisions Room (A-19; Centerline)

Prepare, prime and paint space.

14.1.12 PROVISION ROOMS (A-20P & A-20S)

These spaces were not observed.

14.1.13 DYNAMO & CONDENSER ROOM (A-22)

This space is in good structural and fair cosmetic condition.

Figure 345 Dynamo and Condenser Room (A-22)

Prepare, prime and paint space.

14.1.14 EMERGENCY ELECTRIC FIRE PUMP ROOM (A-24S, STARBOARD)

This space is in good structural and fair cosmetic condition.

Figure 346 Emergency Electric Fire Pump Room (A-24S; Starboard)

Prepare, prime and paint space.

14.1.15 ELECTRICAL SUPPLY & ISSUING ROOM (A-24P, PORT)

This space is in good structural and fair cosmetic condition.

Figure 347 Electrical Supply and Issuing Room (A-24P; Port)

Prepare, prime and paint space.

14.2 FRAME No. 77 ½ TO STERN

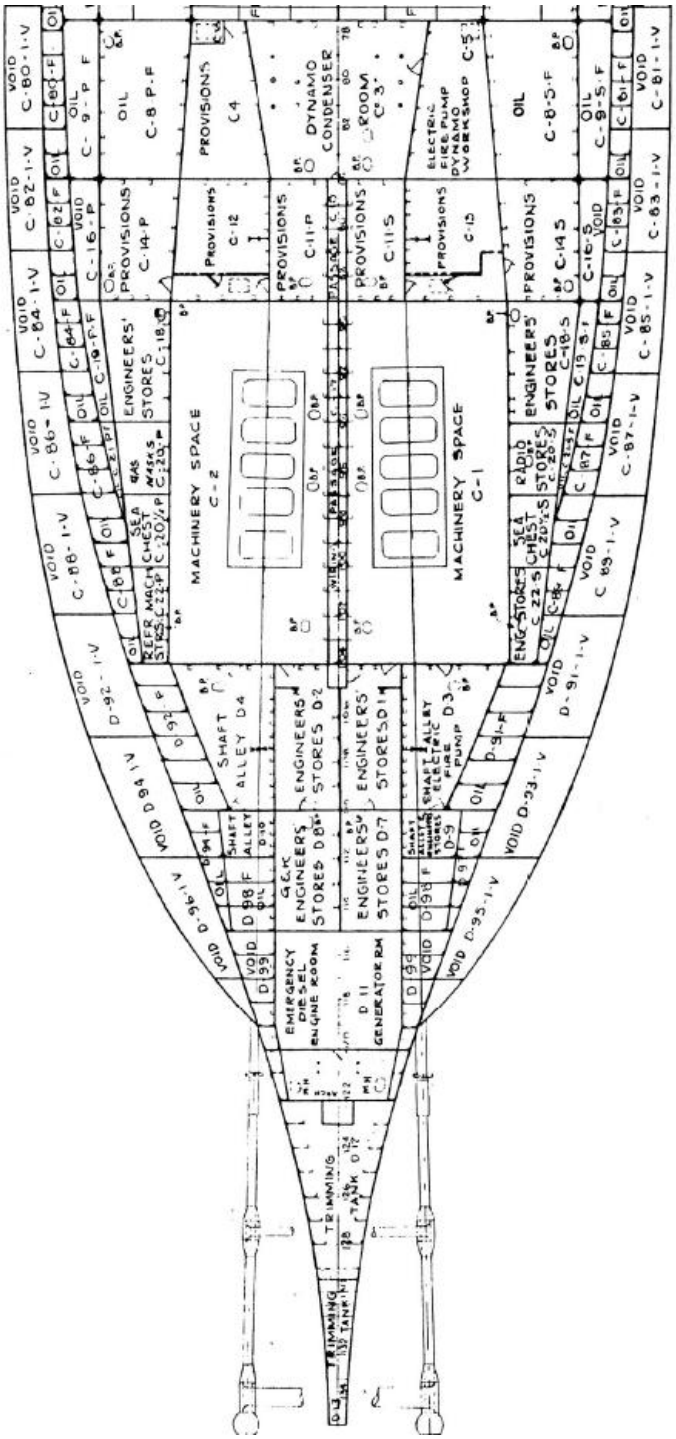


Figure 348 Layout of Hold (Frame No. 77 ½ to Stern)

14.2.1 DYNAMO CONDENSOR ROOM (FRAMES No. 77 ½ - 83, CENTERLINE)

This space is in fair structural and poor cosmetic condition. The deck is weak in many areas and needs to be repaired. Poor air quality within this and lower spaces should be improved with adequate ventilation. Lighting is poor or non-existent.

Provide adequate ventilation to space(s)

Repair/replace deck as needed.

Prepare, prime and paint space.

14.2.2 PROVISIONS ROOM (C-4, PORT)

This space is in fair structural and poor cosmetic condition. The deck is weak in many areas and needs to be repaired. Poor air quality within this and lower spaces should be improved with adequate ventilation. Lighting is poor or non-existent.

Provide adequate ventilation to space(s)

Repair/replace deck as needed.

14.2.3 ELECTRIC FIREPUMP WORKSHOP (C-5, STARBOARD)

This space is in fair structural and poor cosmetic condition. The deck is weak in many areas and needs to be repaired. Poor air quality within this and lower spaces should be improved with adequate ventilation. Lighting is poor or non-existent.

Provide adequate ventilation to space(s)

Repair/replace deck as needed.

14.2.4 PROVISIONS ROOM (C-11P & C-11S, FRAMES No. 84 ½ - 89)

This space is in fair structural and poor cosmetic condition. The deck is weak in many areas and needs to be repaired. Poor air quality within this and lower spaces should be improved with adequate ventilation. Lighting is poor or non-existent.

Provide adequate ventilation to space(s)

Repair/replace deck as needed.

14.2.5 PROVISIONS ROOM (C-12P & C-13S, FRAMES 84 ½ - 89)

This space is in fair structural and poor cosmetic condition. The deck is weak in many areas and needs to be repaired. Poor air quality within this and lower spaces should be improved with adequate ventilation. Lighting is poor or non-existent.

Provide adequate ventilation to space(s)

Repair/replace deck as needed.

14.2.6 PROVISION ROOMS (C-14S & C-14P)

These space were not observed.

14.2.7 MACHINERY SPACES (FRAMES No. 89 – 104)

Some understanding of the complexity of the steam engines (Figure 349) is in order as they take a large portion of this area of the hull and will be a key consideration with regard to the movement of the ship given their enormous weight standing on insufficient structure.

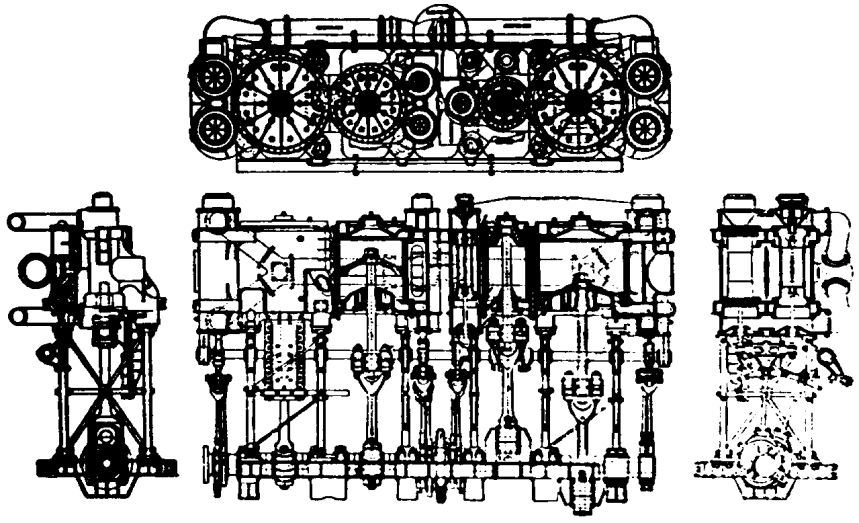


Figure 349 Schematic of Battleship TEXAS (BB-35) Reciprocating Steam Engine[1].

The Battleship TEXAS (BB-35) is the last surviving warship of its kind--powered by reciprocating steam engines. It was built during a period in which naval authorities were switching to the newly-developed steam turbine for propulsion, but were unsure of its suitability. Only one more warship, the New York, commissioned one month after the Texas, was to be powered by the reciprocating engines. Such was the state of the art at the time that the engines were described as "the ultimate in naval reciprocating engine construction." They could be rightfully described in these glowing terms, as was shown by their dependable service from 1914 until after World War II, when the Texas was removed from the Navy's active roster.

For these reasons, the Battleship Texas, with its reciprocating steam engines, has been declared a National Historic Mechanical Engineering Landmark[2].

The Texas was propelled by twin screws driven by 4-cylinder triple-expansion engines having a total designed horsepower of 28,100 at 125 revolutions per minute, with steam at 265 pounds per square inch. Cylinder bores were: High Pressure, 39 inches; Intermediate Pressure, 63 inches; and two low pressure

[1] 'National Historic Mechanical Engineering Landmark Reciprocating Steam Engines - U.S.S. Texas' The Battleship Texas Commission, State of Texas, The American Society of Mechanical Engineers, Houston, Texas December 1, 1975

[2] 'National Historic Mechanical Engineering Landmark Reciprocating Steam Engines - U.S.S. Texas' The Battleship Texas Commission, State of Texas, The American Society of Mechanical Engineers, Houston, Texas December 1, 1975

83 inch cylinders, all with a 48-inch stroke. Cylinder sequence was: Forward Low Pressure, High Pressure, Intermediate Pressure, Aft Low Pressure. The crank angles were 90 degrees, and the working sequence was: High, Intermediate, Forward Low, Aft Low. Piston valves were used on all cylinders, one for the high pressure cylinder, and two for each of the others, actuated by Stephenson's double-link valve gear.

The bedplates were cast steel and the framing was Navy-type forged steel columns bolted to the bedplate and cylinders, braced by diagonal, cross, and longitudinal stays. The cylinders and valve chests were cast iron, the working liners being close-grained cast iron. All cylinders except the high pressure were steam-jacketed around the liners and at both ends. The conical pistons were cast steel, except the high pressure, which was cast iron.

All working and moving parts of the main engines, except the valve links and valve-stem guides, were force-lubricated under a pressure of about 50 pounds per square inch. The crank pits were totally enclosed by galvanized sheet-steel casings up to within 18 inches of the bottoms of the cylinders.

14.2.7.1 ENGINEROOM (C-1, STARBOARD)

Located to starboard, this space has seen extensive restoration efforts, being partially open to the public. The space is well lighted, has adequate handrails, excellent footing and grab rods. The space is in excellent cosmetic condition. This space is partially open to the public.

Of concern is the foundation for this engine in that the weight of this structure depends upon the strength of the underlying trio of inner bottom tank scantlings. There is very little ‘meat’ left within the scantlings below (engine room floor, transverse frames, longitudinal frames, keel) the main engine. The engine’s base foundation has also been impacted by corrosion issues.

Other major components, foundations and platforms in this space are in fine shape but all suffer from a lack of support from the inner bottom tanks. Fore and aft bulkheads are holed with corrosion issues.

Figure 350 Intermediate Flat in Engine Room C-1 (Starboard)

Figure 351 Lower Floor of Engine Room C-1 (Starboard)

Repair main engine foundation where possible. Consider a holistic approach to this repair and tie into repairs made to the underlying inner bottom tankage.

14.2.7.2 ENGINEROOM (C-2, PORT)

Located to port, this space has not seen extensive restoration efforts, and is not open to the public. The space is poorly lighted, has adequate handrails, excellent footing and grab rods. The space is in poor cosmetic condition.

Of concern is the foundation for this engine in that the weight of this structure depends upon the strength of the underlying trio of inner bottom tank scantlings. There is very little 'meat' left within the scantlings below (engine room floor, transverse frames, longitudinal frames, keel) the main engine. The engine's base foundation has also been impacted by corrosion issues.

Other major components, foundations and platforms in this space are in fine shape but all suffer from a lack of support from the inner bottom tanks. Fore and aft bulkheads are holed with corrosion issues.

Figure 352 Intermediate Flat (Left Panel) and Foundation Under Main Engine in Engine Room C-2 (Starboard)

Repair main engine foundation where possible. Consider a holistic approach to this repair and tie into repairs made to the underlying inner bottom tankage.

14.2.7.3 ENGINEER STORES (D-1)

This space is in poor structural and poor cosmetic condition. Deck is perforated in several areas, especially adjacent to both bulkheads. Watertight dogging door is in need of repair.

Figure 353 Engineer Stores (D-1)

Repair dogging watertight doors as needed.

Repair/replace deck as needed. Repair forward and aft bulkhead as needed.

Prepare, prime and pain space after removal of debris.

14.2.7.4 ENGINEER STORES (D-7)

This space is in poor structural and poor cosmetic condition. Deck is perforated in several areas, especially adjacent to both bulkheads. Watertight dogging door is in need of repair.

Figure 354 Engineer Stores (D-7)

Repair dogging watertight doors as needed.

Repair/replace deck as needed. Repair forward and aft bulkhead as needed.

Prepare, prime and pain space after removal of debris.

14.2.7.5 ENGINEER STORES (D-2)

This space is in poor structural and poor cosmetic condition. Deck is perforated in several areas, especially adjacent to both bulkheads. Watertight dogging door is in need of repair.

Figure 355 Engineer Stores (D-2)

Repair dogging watertight doors as needed.

Repair/replace deck as needed. Repair forward and aft bulkhead as needed.

Prepare, prime and pain space after removal of debris.

14.2.7.6 ENGINEER STORES (D-8)

This space is in poor structural and poor cosmetic condition. Deck is perforated in several areas, especially adjacent to both bulkheads. Watertight dogging door is in need of repair.

Figure 356 Engineer Stores (D-8)

Repair dogging watertight doors as needed.

Repair/replace deck as needed. Repair forward and aft bulkhead as needed.

Prepare, prime and pain space after removal of debris.

14.2.7.7 SHAFT ALLEY (D-3, STARBOARD)

This space is in poor structural and poor cosmetic condition. Deck is perforated in several areas, especially adjacent to both bulkheads. Space partially opened to the public during tours. Watertight dogging door is in need of repair.

Figure 357 Shaft Alley (D-3; Starboard)

Repair dogging watertight doors as needed.

Repair/replace deck as needed. Repair forward and aft bulkhead as needed.

Prepare, prime and pain space after removal of debris.

14.2.7.8 SHAFT ALLEY (D-4, PORT)

This space is in poor structural and poor cosmetic condition. Deck is perforated in several areas, especially adjacent to both bulkheads. Watertight dogging door is in need of repair.

Figure 358 Shaft Alley (D-4; Port)

Repair dogging watertight doors as needed.

Repair/replace deck as needed. Repair forward and aft bulkhead as needed.

Prepare, prime and pain space after removal of debris.

14.2.7.9 AFT EMERGENCY DIESEL GENERATOR ROOM (D-11)

This space is in poor structural and poor cosmetic condition. Watertight dogging door is in need of repair/replacement. Deck is perforated in many areas, especially adjacent to both bulkheads. Foundations for diesel generator are heavily wasted and sit on a wasted floor and wasted scantlings from the inner bottom tank.

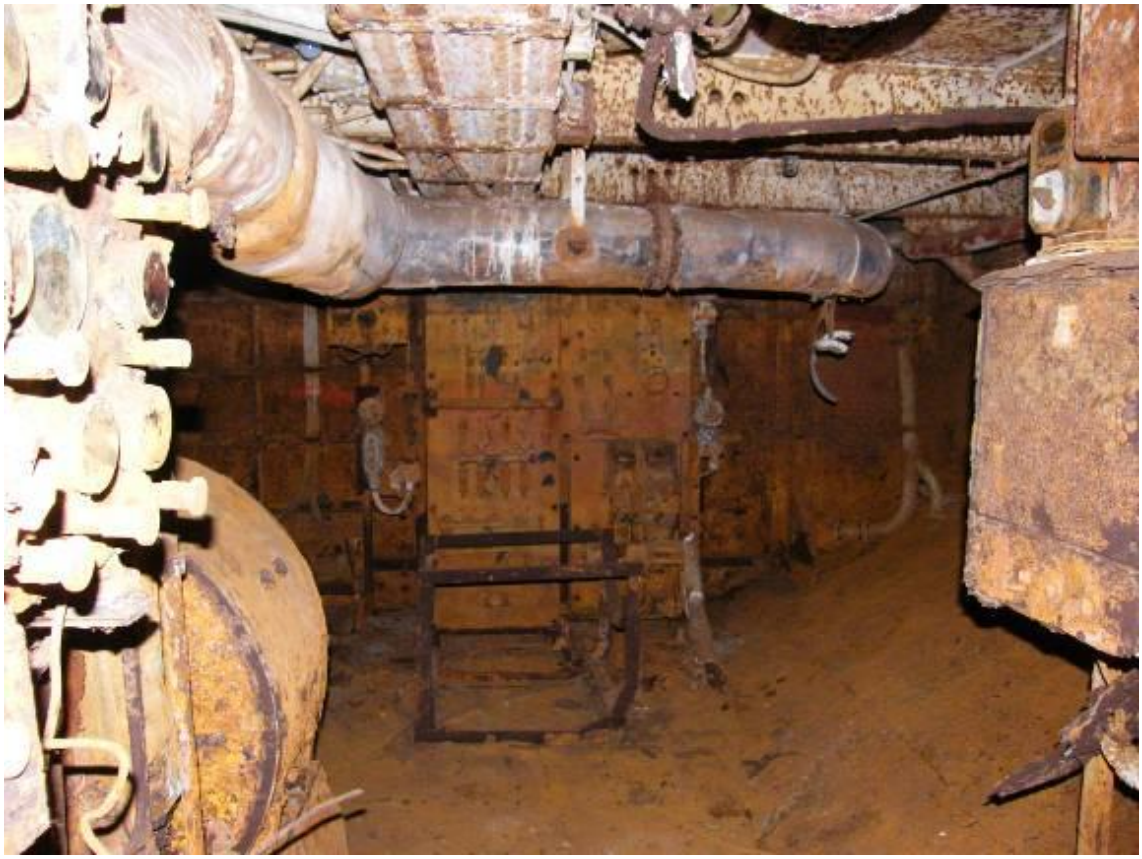


Figure 359 Aft Emergency Diesel Generator Room (D-11)

This space is unsafe for entry

Replace wasted dogging watertight door.

Repair/replace deck as needed. Repair forward and aft bulkhead as needed.

Prepare, prime and pain space after removal of debris.

15 INNER BOTTOM TANKAGE

15.1 FRAMES No. 9 – 56

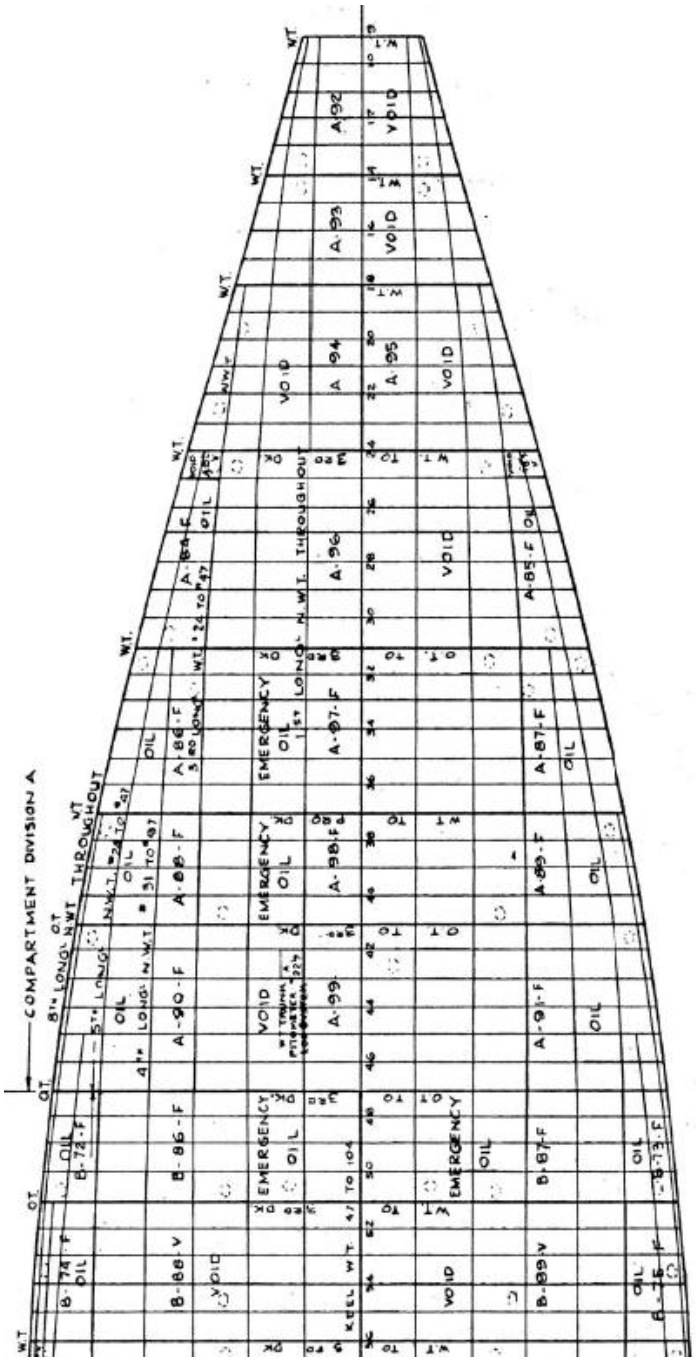


Figure 360 Layout of Inner Bottom Tankage (Frames No. 9 – 56)

15.1.1 VOID (A-92, FRAMES No. 9 – 14)

Tanks shell plating exhibits greater than 50% loss. There is heavy rust/scale throughout the compartment. Longitudinal Frames show 25 -40% plate loss with scale mostly in lower portions of space. Keel shows greater than 50% plate loss. There is no standing water.

Figure 361 Void (A-92, Frames No. 9 – 14)

15.1.2 VOID (A-93, FRAMES No. 14 – 18)

Tank shell plating exhibits greater than 50% loss. There is heavy rust/scale throughout the compartment. Longitudinal Frames show 25 -40% plate loss with scale mostly in lower portions of space. Keel shows greater than 50% plate loss. There is no standing water.

Figure 362 Void (A-93, Frames No. 14 – 18)

15.1.3 VOID (A-94, FRAMES No. 18 – 24, PORT)

Tank shell plating exhibits greater than 60% loss. There is heavy rust/scale throughout the compartment. Longitudinal Frames show 40% plate loss with scale mostly in lower portions of space. Keel shows greater than 60% plate loss. There is standing water 2-3" from weeping rivets. Keel gussets are bent and tripped.

Figure 363 Void (A-94, Frames No. 18-24; Port)

15.1.4 VOID (A-94, FRAMES No. 18 – 24, STARBOARD)

Tank shell plating exhibits greater than 60% loss. There is heavy rust/scale throughout the compartment. Longitudinal Frames show 40% plate loss with scale mostly in lower portions of space. Keel shows greater than 60% plate loss. There is standing water 2-3" from weeping rivets. Keel gussets are bent and tripped.

Figure 364 Void (A-94, Frames No. 18 – 24; Starboard)

15.1.5 VOID (A-95, FRAMES No. 18 – 24, STARBOARD)

Tank shell plating exhibits greater than 60% loss. There is heavy rust/scale throughout the compartment. Longitudinal Frames show 40% plate loss with scale mostly in lower portions of space. Keel shows greater than 60% plate loss. There is minor standing water adjacent to keel from weeping rivets.

Figure 365 void (A-95, Frames No. 18-24; Starboard)

15.1.6 VOID (A-96, FRAMES No. 24 – 31)

Tank shell plating exhibits greater than 60% loss. There is heavy rust/scale throughout the compartment. Longitudinal Frames show 40% plate loss with scale mostly in lower portions of space. Keel shows greater than 60% plate loss. Both docking keel rivets seams are heavily wasted and weeping. 2-3" of standing water adjacent to keel on both sides. Keel gussets compressed throughout tank on both sides. Keel is holed.

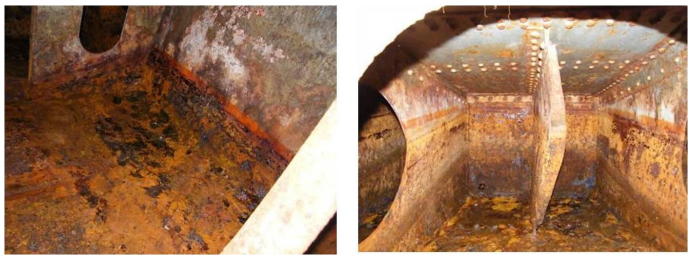


Figure 366 Void (A-96, Frames No. 24 – 31)

15.1.7 VOID (A-97F, FRAMES No. 31 – 37)

Tank shell plating exhibits greater than 50 - 60% loss. There is heavy rust/scale throughout the compartment. Longitudinal Frames show 40% plate loss with scale mostly in lower portions of space. Keel shows greater than 50% plate loss. Aft bulkhead is non-watertight. Keel gussets are compressed throughout tank on both sides.

Figure 367 Void (A-97 F, Frames No. 31 – 37)

15.1.8 VOID (A-98F, FRAMES No. 37 – 41)

Tank shell plating exhibits greater than 60 - 70% loss. There is heavy rust/scale throughout the compartment. Longitudinal Frames show 50% plate loss with scale mostly in lower portions of space. Keel shows greater than 50% plate loss. Forward bulkhead is non-watertight. Keel gussets are compressed throughout tank on both sides; keel is holed throughout.

Figure 368 Void (A-98F, Frames No. 37 – 41)

15.1.9 VOID (A-99V, FRAMES No. 41 -47)

Tank shell plating exhibits greater than 60 - 70% loss. There is heavy rust/scale throughout the compartment. Longitudinal Frames show 60% plate loss with scale mostly in lower portions of space. Keel shows greater than 50% plate loss. There is standing water 3" at keel on both sides due to weeping rivets. Keel gussets are compressed throughout tank on both sides; keel is holed throughout.

Figure 369 Void (A-99V, Frames No. 41 – 47)

15.1.10 B-86F & B-87F

These spaces were not observed.

15.1.11 VOID (B-88V, FRAMES No. 47 – 56, PORT)

Tank shell plating exhibits greater than 60 - 70% loss. There is heavy rust/scale throughout the compartment. Longitudinal Frames show 60% plate loss with scale mostly in lower portions of space. Keel shows greater than 50% plate loss. There is 1" of standing water at keel due to weeping rivets. Keel gussets are compressed throughout tank on both sides.

Figure 370 Void (B-88V, Frames No. 47 – 56; Port)

15.1.12 VOID (B-89V, FRAMES No. 47 – 56, STARBOARD)

Tank shell plating exhibits greater than 60 - 70% loss. There is heavy rust/scale throughout the compartment. Longitudinal Frames show 60% plate loss with scale mostly in lower portions of space. Keel shows greater than 50% plate loss. There is 3" of standing water at keel due to weeping rivets. Keel gussets are compressed throughout tank on both sides; keel is holed throughout.

Figure 371 Void (B-89V, Frames No. 47 – 56; Starboard)

Tank repairs for areas described above (for Frame No.9 – Frame No. 56) are not needed critically and are not anticipated to be required prior to dry berthing.

Prepare, prime and pain space after removal of debris.

15.2 FRAMES No. 56 - 89

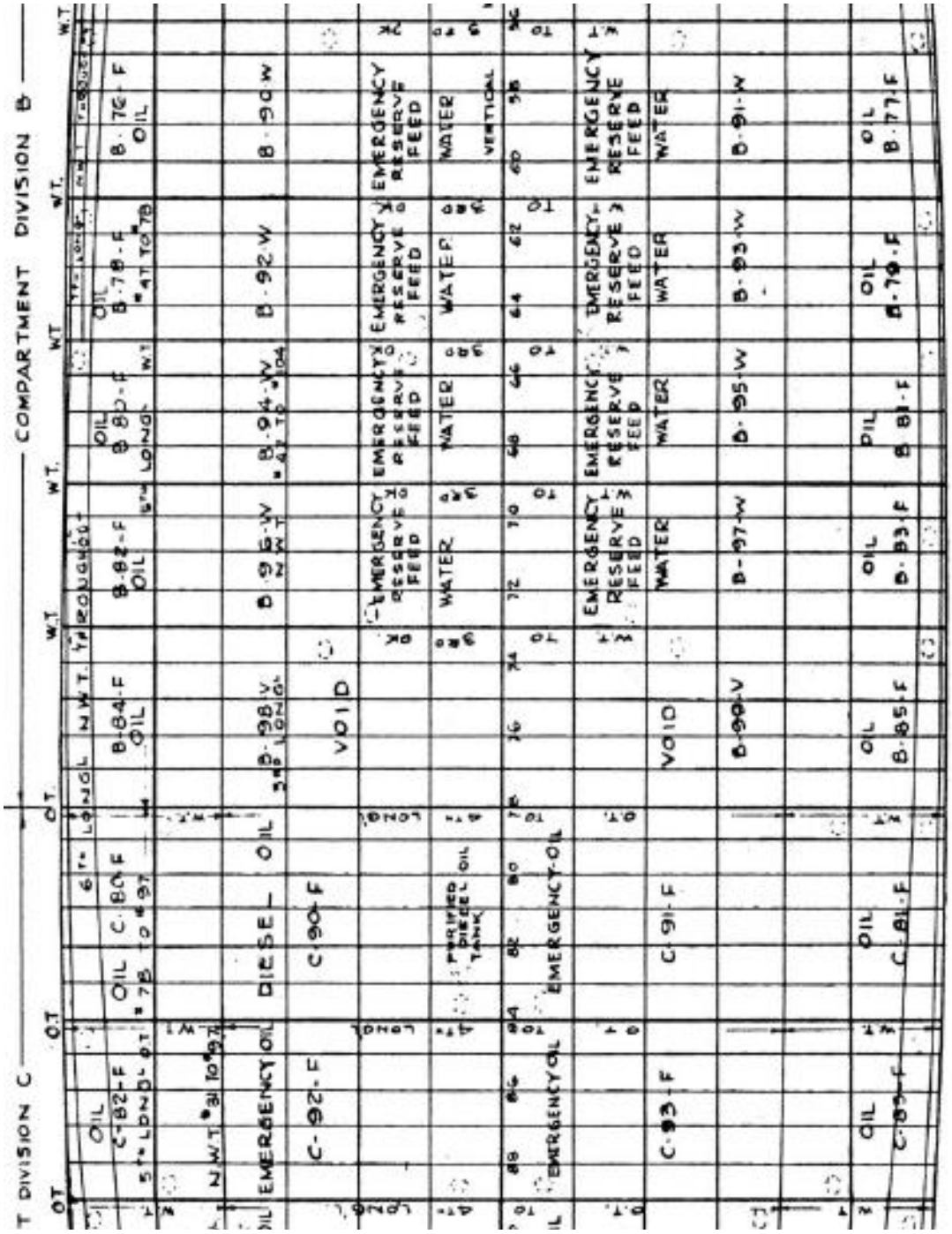


Figure 372 Layout of Inner Bottom Tankage (Frames No. 56 – 89)

15.2.1 FEED WATER TANK (B-90W, PORT)

Tank shell plating exhibits greater than 60 - 70% loss. There is heavy rust/scale throughout the compartment. Longitudinal Frames show 60% plate loss with scale mostly in lower portions of space. Keel shows greater than 50% plate loss. There is 3" of standing water at keel due to weeping rivets.

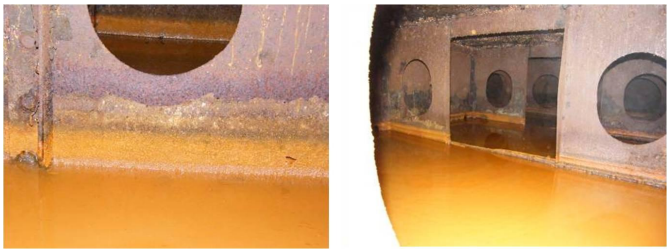


Figure 373 Feed Water Tank (B-90W; Port)

15.2.2 FEED WATER TANK (B-91W, STARBOARD)

Tank shell plating exhibits greater than 60 - 70% loss. There is heavy rust/scale throughout the compartment. Longitudinal Frames show greater than 60% plate loss with scale mostly in lower portions of space. Keel shows greater than 50% plate loss. There is 4" of standing water at keel due to weeping rivets.

Figure 374 Feed Water Tank (B-91W; Starboard)

15.2.3 FEED WATER TANK (B-92W, PORT)

Tank shell plating exhibits greater than 60 - 70% loss. There is heavy rust/scale throughout the compartment. Longitudinal Frames show greater than 60% plate loss with scale mostly in lower portions of space. Keel shows greater than 50% plate loss. Transverse frames bent and distorted throughout space. There is 4" of standing water at keel due to weeping rivets.

Figure 375 Feed Water Tank (B-92W; Port)

15.2.4 FEED WATER TANK (B-93W, STARBOARD)

This tank, and the hold tank above, are under Boiler No.3 which is starting to collapse. Tank shell plating exhibits greater than 60 - 70% loss. There is heavy rust/scale throughout the compartment. Longitudinal Frames show greater than 60% plate loss with scale mostly in lower portions of space. Keel shows greater than 50% plate loss. Transverse frames are bent and distorted throughout the space. There is standing water 5" at keel due to weeping rivets.

Figure 376 Feed Water Tank (B-93W; Starboard)

15.2.5 FEED WATER TANK (B-94W, PORT)

Forward bulkhead is non-watertight. Tank shell plating exhibits greater than 60 - 70% loss. There is heavy rust/scale throughout the compartment. Longitudinal Frames show greater than 75% plate loss with scale mostly in lower portions of space. Keel shows greater than 70% plate loss. Transverse frames are bent and distorted throughout space. There is 3" of standing water at keel due to weeping shell plating and rivets.

Figure 377 Feed Water Tank (B-94W; Port)

15.2.6 FEED WATER TANK (B-95W, STARBOARD)

Forward bulkhead is non-watertight. Tank shell plating exhibits greater than 60 - 70% loss. There is heavy rust/scale throughout the compartment. Longitudinal Frames show greater than 75% plate loss with scale mostly in lower portions of space. Keel shows greater than 70% plate loss. Transverse frames are bent and distorted throughout space. There is 3" of standing water at keel due to weeping shell plating and rivets.

Figure 378 Feed Water Tank (B-95W; Starboard)

15.2.7 FEED WATER TANK (B-96W, PORT)

Forward bulkhead is non-watertight. Tank shell plating exhibits greater than 60 - 70% loss. There is heavy rust/scale throughout the compartment. Longitudinal Frames show greater than 75% plate loss with scale mostly in lower portions of space. Keel shows greater than 70% plate loss. Transverse frames bent and distorted throughout space. There is 3" of standing water at keel due to weeping shell plating and rivets.

Figure 379 Feed Water Tank (B-96W; Port)

15.2.8 FEED WATER TANK (B-97W, STARBOARD)

Tank shell plating exhibits greater than 60 - 70% loss. There is heavy rust/scale throughout the compartment. Longitudinal Frames show greater than 75% plate loss with scale mostly in lower portions of space. Keel shows greater than 70% plate loss. Transverse frames are bent and distorted throughout space. The compartment is dry. Plating was installed adjacent to keel at time of last dry docking.

Figure 380 Feed Water Tank (B-97W; Starboard)

15.2.9 VOID (B-98V, PORT)

Tank shell plating exhibits greater than 60 - 70% loss. There is heavy rust/scale throughout the compartment. Longitudinal Frames show greater than 60% plate loss with scale mostly in lower portions of space. Keel shows greater than 60% plate loss. Transverse frames are bent and distorted throughout space. Compartment is dry.

Figure 381 Void (B-98V; Port)

15.2.10 VOID (B-99V, STARBOARD)

Tank shell plating exhibits greater than 60% loss with heavy indentation on bottom. New 4' x 4' plating has been installed; seepage at weldment indicates poor weldments. There is heavy rust/scale throughout the compartment. Longitudinal Frames show greater than 40-50 % plate loss with scale mostly in lower portions of space. Keel shows greater than 50% plate loss. Transverse frames are bent and distorted throughout space. The compartment is dry.

Figure 382 Void (B-99V; Starboard)

15.2.11 FUEL TANK (C-90F, PORT)

The aft bulkhead is holed. Tank shell plating exhibits greater than 70% loss with heavy indentation on bottom. There is heavy rust/scale throughout the compartment. Longitudinal Frames show greater than 70 % plate loss with scale mostly in lower portions of space. Keel shows greater than 50% plate loss. Transverse frames are bent and distorted throughout space. The compartment is dry.

Figure 383 Fuel Tank (C-90F; Port)

15.2.12 FUEL TANK (C-91F, STARBOARD)

Aft bulkhead is holed. Tank shell plating exhibits greater than 70% loss with heavy indentation on bottom. There is heavy rust/scale throughout the compartment. Longitudinal Frames show greater than 70 % plate loss with scale mostly in lower portions of space. Keel shows greater than 50% plate loss. Transverse frames are bent and distorted throughout space. There is 4" standing water from weeping rivets.

Figure 384 Fuel Tank (C-91F; Starboard)

15.2.13 FUEL TANK (C-92F, PORT)

Aft bulkhead is holed. Tank shell plating exhibits greater than 80% loss with heavy indentation on bottom. There is heavy rust/scale throughout the compartment. Longitudinal Frames show greater than 70 % plate loss with scale mostly in lower portions of space. Keel shows greater than 50% plate loss. Transverse frames are bent and distorted throughout space. There is 4" standing water from weeping rivets.

Figure 385 Fuel Tank (C-92 F; Port)

15.2.14 FUEL TANK (C-93F, STARBOARD)

Tank shell plating exhibits greater than 80% loss. There is heavy rust/scale throughout the compartment. Longitudinal Frames show greater than 70 % plate loss with scale mostly in lower portions of space. Keel shows greater than 70% plate loss. Transverse frames are bent and distorted throughout space. There is 7" standing water from weeping rivets and bottom plating.

Figure 386 Fuel Tank (C-93F; Starboard)

All tankage aft of Frame No. 64 to Frame No. 89 are in need of immediate repairs to keel, transverse and longitudinal frames and transverse watertight bulkheads.

15.3 FRAMES No. 89 – 122

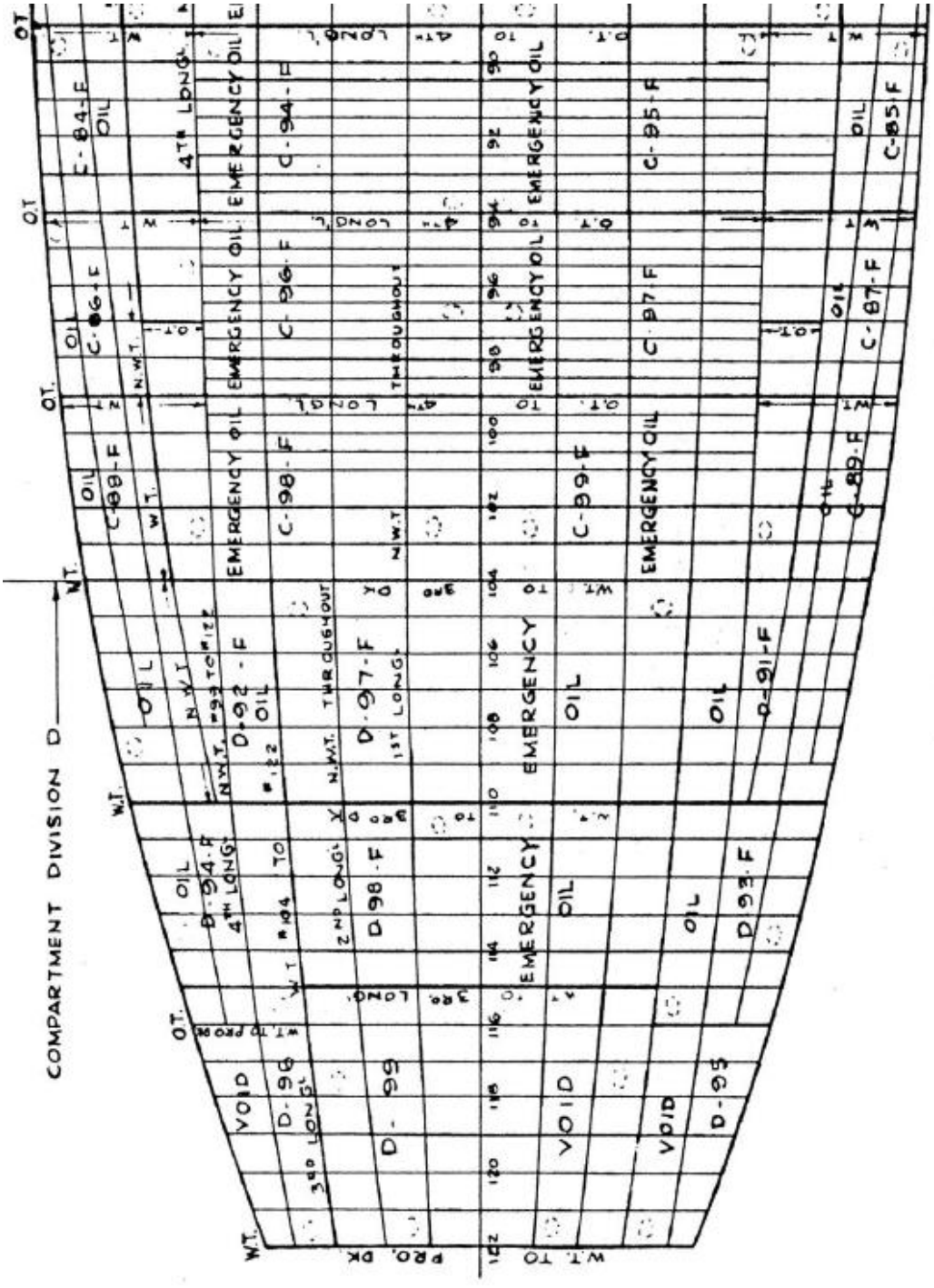


Figure 387 Inner Bottom Tankage (Frames No. 89 – 122)

15.3.1 PORT ENGINEROOM TANKS

Photographs were not taken of these engine room tanks because of high water within these spaces.

15.3.1.1 C-94F (PORT)

Tank shell plating exhibits greater than 80% loss. There is heavy rust/scale throughout the compartment. Longitudinal Frames show greater than 70 % plate loss with scale mostly in lower portions of space. Keel shows greater than 70% plate loss and is holed throughout the length. Transverse frames are badly bent and distorted or missing altogether throughout space. There is 10-12" standing water from weeping rivets and bottom plating. Aft bulkhead is not watertight. Space was observed to be free flooding after pump-down. The space is free flooding in that Inspection Team would wipe clean rivets seams and watch water come in from around rivets. Also, TPWD pump teams dewatered port spaces early in the morning (0600 – 0900) and Inspection Team has to call them back at 1000 when tanks were observed to be partially full.

15.3.1.2 C-96F (PORT)

Tank shell plating exhibits greater than 80% loss. There is heavy rust/scale throughout the compartment. Longitudinal Frames show greater than 70 % plate loss with scale mostly in lower portions of space. Keel shows greater than 70% plate loss and is holed throughout the length. Transverse frames are badly bent and distorted or missing altogether throughout space. There is 10-12" standing water from weeping rivets and bottom plating. Forward bulkhead not watertight. Space was observed to be free flooding after pump-down. See also notes for C-94F.

14.3.1.3 C-98F (PORT)

Tank shell plating exhibits greater than 80% loss. There is heavy rust/scale throughout the compartment. Longitudinal Frames show greater than 70 % plate loss with scale mostly in lower portions of space. Keel shows greater than 70% plate loss and is holed throughout the length. Transverse frames are badly bent and distorted or missing altogether throughout space. There is 10-12" standing water from weeping rivets and bottom plating. Space was observed to be free flooding after pump-down. See also notes for C-94F.

15.3.1.3 C-95F & C-97F (STARBOARD)

This space was not observed due to very high water levels and oil atop water.

15.3.1.4 C-99 F (STARBOARD)

Tank shell plating exhibits greater than 80% loss. There is heavy rust/scale throughout the compartment. Longitudinal Frames show greater than 70% plate loss with scale mostly in lower portions of space. Keel shows greater than 70% plate loss and is holed throughout the length. Transverse frames are badly bent and distorted or missing altogether throughout space. There is 8-10" standing water from weeping rivets and bottom plating. See also notes for C-94F.

It is anticipated that repairs in the form of a box girder or an inverse bridge from above (with cables) will need to be fitted to support each main engine. The keel and main transverse/longitudinal members within these tanks will also require repair/replacement to properly support the main engine foundations.

15.3.2 FUEL TANK (D-97F)

Tank shell plating exhibits greater than 80% loss. There is heavy rust/scale throughout the compartment. Longitudinal Frames show greater than 70 % plate loss with scale mostly in lower portions of space. Keel not observed due to standing water. Transverse frames are badly bent and distorted or missing altogether throughout space. There is 20 - 25" standing water from weeping

rivets and bottom plating. Aft bulkhead is not watertight. Space is free flooding.

Figure 388 Fuel Tank (D-97F)

15.3.3 FUEL TANK (D-98F)

Tank shell plating exhibits greater than 80% loss. There is heavy rust/scale throughout the compartment. Longitudinal Frames show greater than 70 % plate loss with scale mostly in lower portions of space. Keel has greater than 60% plate loss.. Transverse frames are badly bent and distorted or missing altogether throughout space. There is 6 - 8" standing water from weeping rivets and bottom plating.

Figure 389 Fuel Tank (D-98F)

15.3.4 VOID (D-99V)

Tank shell plating exhibits greater than 80% loss. There is heavy rust/scale throughout the compartment. Longitudinal Frames show greater than 70 % plate loss with scale mostly in lower portions of space. Badly tripped and distorted transverse frames throughout space. Keel has greater than 60% plate loss. There is 12" standing water from weeping rivets and bottom plating.

Figure 390 Void (D-99V)

The tankage within D-97V, D-98V and D-99V need to be dewatered and it should be ensured that no standing oil is present. Repair/replace damaged frames, keel and bulkheads as needed to adequately support structure above and to ensure watertight integrity between tankage.

15.4 FRAMES No. 122 – 137

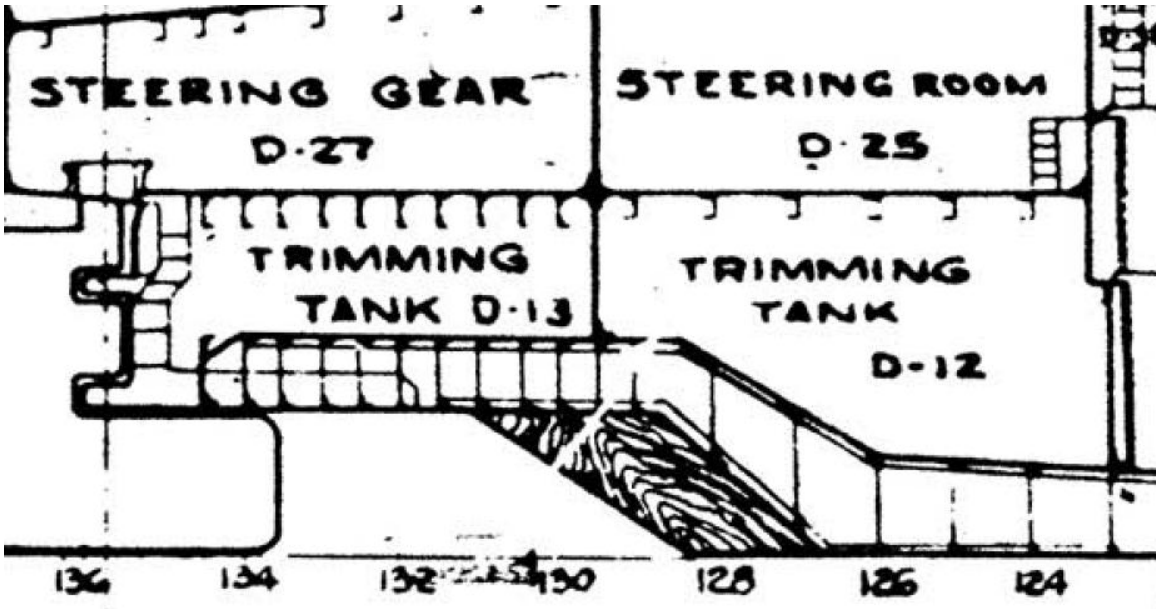


Figure 391 Layout of Inner Bottom Tankage (Frames No. 122 – 137)

15.4.1 TRIMMING TANK VOID (D-12V, FRAMES 123 – 128 ½)

This space is just below the steering room and originally supported all of the decks, stanchions and foundations above. This space was flooded (reportedly), for decades with salt water and has now deteriorated throughout to a dangerous degree.

Tank shell plating exhibits greater than 80% loss with heavy leakage noted on the forward starboard side at the wind/waterline and to port opposite. An automatic pump is fitted to regularly dewater this space.. There is heavy rust/scale throughout the compartment. Longitudinal frames show greater than 80 % plate loss with heavy scale mostly in all portions of the space. There are badly tripped and distorted transverse frames throughout space. Keel has greater than 80% plate loss and there is 12" standing water from weeping rivets and bottom plating.

Figure 392 Wasted Keelson at Aft Bulkhead (Trimming Tank Void D-12V)

Figure 393 Wasted Main Transverse Frame (Trimming Tank Void D-12V)

Figure 394 Wasted Shell Plating and Forward Bulkhead Where Major Leak Occurred During the Week of Inspection (Trimming Tank Void D-12V)

Figure 395 Wasted Main Transverse Frame in Lower Area of Trim Tank Showing Wasted Longitudinal Stringer at Right Lower Side of Photo (Trimming Tank Void D-12V)

Figure 396 Typical Wasted Transverse Web Frame in Trim Tank (Trimming Tank Void D-12V)

Figure 397 Wasted Top of Keel in Trim Tank (Trimming Tank Void D-12V)

Figure 398 Wasted and Bent Vertical Stanchions Tied to Wasted Top of Keel with Wasted Pedestal (Trimming Tank Void D-12V)

Figure 399 Wasted and Holed Vertical Support Stanchion Holding Up Steering Room Equipment (Trimming Tank Void D-12V)

This space now needs to be rebuilt to enable the degree of support for the upper structure for moving and dry docking the ship.

Rebuild forward and aft bulkheads to original sized scantlings of affected spaces.

Cut away and replace all frames up to the overhead.

Cut away wasted sections of the keel and repair/replace as needed.

Inset new stanchions and foundations to support steering room.

Patch and repair wasted and leaking plating as needed.

Prepare, prime and paint all surface.

15.4.2 TRIMMING TANK VOID (D-13V, FRAMES No. 128 1/2 – 137)

This space is just below the steering gear room and in good times supported all of the decks, stanchions and foundations above. This space was flooded (reportedly), for decades with salt water and has now deteriorated throughout to a dangerous degree.

Tank shell plating exhibits greater than 80 % loss with heavy leakage noted on the forward starboard side at the wind/waterline and to port opposite. An automatic pump is fitted to regularly dewater this space. There is heavy rust/scale throughout the compartment. Longitudinal Frames show

greater than 80 % plate loss with heavy scale mostly in all portions of the space. There are badly tripped and distorted transverse frames throughout space. Keel has greater than 80% plate loss. There is 12" standing water from weeping rivets and bottom plating.

Figure 400 Typical Detail of Wastage of Main Transverse Web Frame (Trimming Tank Void D-13V)

Figure 401 Cut-away on Keel Showing Wasted Condition of Shell Plating (Trimming Tank Void D-13V)

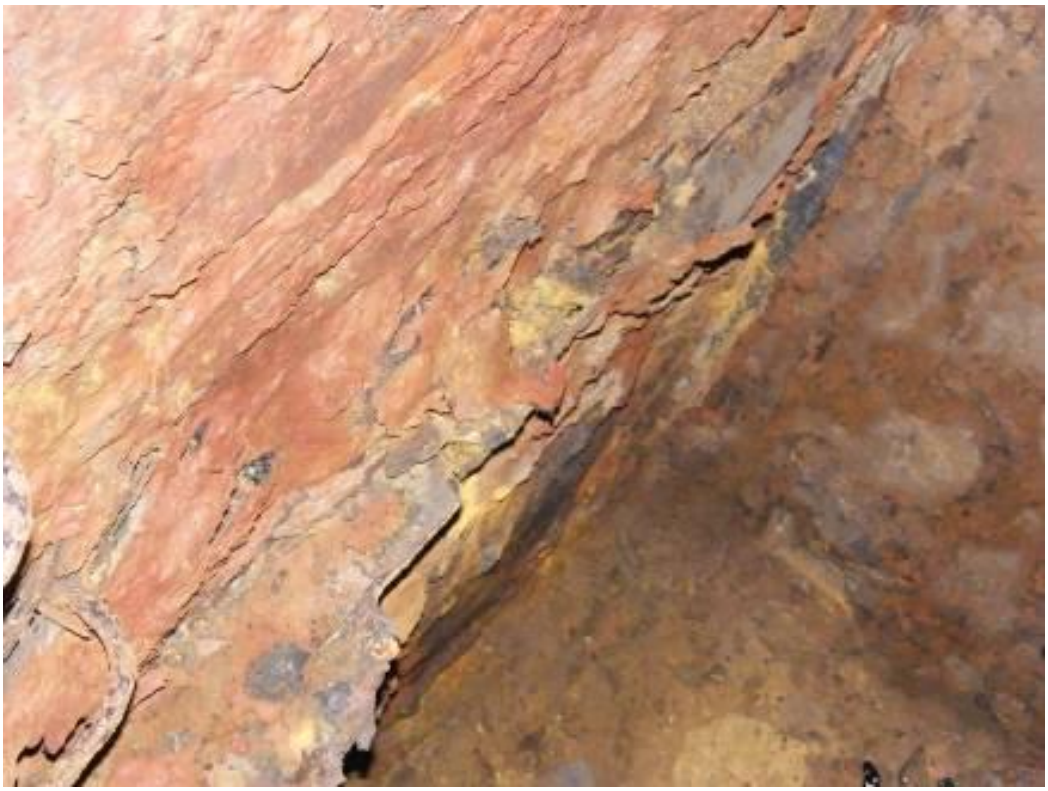


Figure 402 Wastage at Forward Bulkhead in Bilges at Hull Bottom Without Any Good Metal (Trimming Tank Void D-13V)

This space needs to be rebuilt to enable the degree of support for the upper structure for moving and dry docking the ship.

Rebuild forward and aft bulkheads to original sized scantlings.

Cut away and repair/replace all frames up to the overhead.

Cut away wasted sections of the keel and repair/replace as needed.

Inset new stanchions and foundations to support steering room as needed.

Establish cofferdam setting externally and replace wasted plating as needed.

Prepare, prime and paint all surface.

16 HATCHES, DOORS, LADDERS, SCUTTLES AND TANK COVERS

16.1 MAINDECK WATERTIGHT HATCHES

The Main Deck has twelve (12) main hatches for Second Deck entry; nine of which are open. These were largely in good repair with the port and starboard units having canvas protective covers fitted (see Figure). Despite these covers, water still manages to get below causing minimal rust/scale and deterioration of paint systems; of more impact is the amount of humidity that is present below with vast amounts of 'sweating' occurring. This could be alleviated by the addition of a dehumidification system and the installation of air-tight doors at the Main deck hatch locations.

Many of these hatches are missing threaded eye bolts and dogging nuts. None of the closed hatches were opened at time of inspection to determine condition of gasketing. Gasketing on the nine open hatches show wear.

The round scuttle hatches fitted to the tops of the base watertight hatches are not utilized and are kept locked.

Replace and repair missing eye bolts, pins, gasketing, dogging nuts and gaskets as needed.

Figure 402 Main Deck Access Hatch with Fitted Canvas Cover

16.2 WEATHERDECK WATERTIGHT DOGGING DOORS

The dogging watertight doors to the main deck cabins are in good material condition with fair/good gasket material present . Dogging arms and hardware are in mostly good repair and a snug fit is presented by all doors. Some doors are left open on the topside hamper allowing precipitation to enter and lay on interior spaces. The after emergency diesel room watertight bulkhead, dogging door and door frame have totally rusted away.

Replace and repair watertight bulkhead and door to after emergency diesel as needed.

16.3 LADDERS

Ladders in all vertical trunks appeared to be in good repair. Ladders in the five turrets also were in fine shape. Ladders throughout the ship require securing pins and mounting bolts.

Replace missing pins and mounting bolts as needed for all ladders.

16.4 BELOW DECK WATERTIGHT DOGGING HATCHES

Located primarily on the Second Deck, these provide primary entrance to the Third Deck spaces. These hatches are kept closed and locked both within and outside the public access tour routes. The condition of gasketing was not determined. Dogging hardware is in generally good condition. The watertight dogging hatches on Third Deck and below generally in good condition although many are missing support arms and pins to secure them in the open position. Gaskets appear to be in mostly good condition.

A systemic closing and dogging of all hatches below the waterline should be completed.

16.5 SCUTTLES

The oval dogging scuttles are each equipped with two operating wheels one on each side of the hatch. Dogging scuttles are largely intact and operational but all require lubrication and some may require new gaskets.

16.6 MANHOLE TANK COVERS

The flat and flush type manholes are provided with 1/8 in. plant fiber gaskets except the fresh water tanks which have 1/8 in. sheet asbestos and the reduction gear oil tanks which have a 1/16 in. asbestos sheet gasket. The boiler-type manholes are provided with 7/8 in. x 11/16 in. rubber gaskets. The bolted hatches and manholes on the ballast and fuel tanks were all opened on the centerline; these were all in good condition with gaskets in mostly good repair although some will need to be replaced. The crew should re-cover all opened tank hatches.

The tanks covers and surrounding framework were missing on the tanks within the CPO Mess and Galley.

The blister tank exterior tank covers were all removed at time of survey; these were in good repair. The mounting threaded studs, washers and nuts were in good order.

Replace missing or thin gasketing, nuts and washers as needed.

17 HOGGING/SAGGING, VENTILATION AND RIGGING

Sagging, or hogging, is the settling of the bow and stern of a ship with respect to the amidships section. The battleship TEXAS is generally regarded as a 'straight deck' ship having little sheer (curvature of the hull fore and aft). The surveying team did not observe any hogging or sagging aboard the vessel which would reflect the longitudinal deflection of structural members. The deck camber appeared to be normal ('as built') forward, amidships and aft with the exception that the Main Deck surface has some compression from Frame No. 28 to approximately Frame No. 41 to a depth of approximately 5 inches. Below decks, the effect of this depression of the Main Deck can be best seen in the slightly bucked bulkheads leading forward, but which is not a structural concern at this time. The long term monitoring of this area, primarily on the Half Deck, can be accomplished by installing a series of plumb bobs on a line from the overhead to just above the deck below, forward to aft, port to starboard. A GPS system can be utilized to give the same information on hogging or sagging.

The ship suffers from a lack of de-humidification throughout. The Second and Third decks could use active HVAC/air conditioning in summer to relieve the terrible humidity. The lower spaces below the waterline could also benefit from de-humification to relieve the 'sweating' observed in most areas of the ship outside the public visitation routes. The installation of a de-humidification system would greatly lessen the rust/scale and breakdown of ship's interior paint coating system and structure.

The shrouds, turnbuckles, seizings and stays for the stack with their deck padeyes are in good material condition (see Figure 403). The condition of the pair of cranes has been documented elsewhere within this report.

Figure 403 Arrangement of Stack Shrouds/Standing Rigging

18 COMMONIZATION OF INTERIOR BILGE SPACES

The vessel has had a bilge pumping system installed during the late 1980s as detailed within the drawings provided to the Surveyor. The report for this system was not discovered at or after the time of survey. This system basically links 2, 4 or 6 tanks together with a single common discharge manifold with a 'quick' disconnect fitting for pumping. This system, reportedly, is not utilized to de-water the ship. The current methodology is to remove a tank cover, insert discharge hose and pump contents overboard. Figure 404 shows a sample cross section of the pumping system.

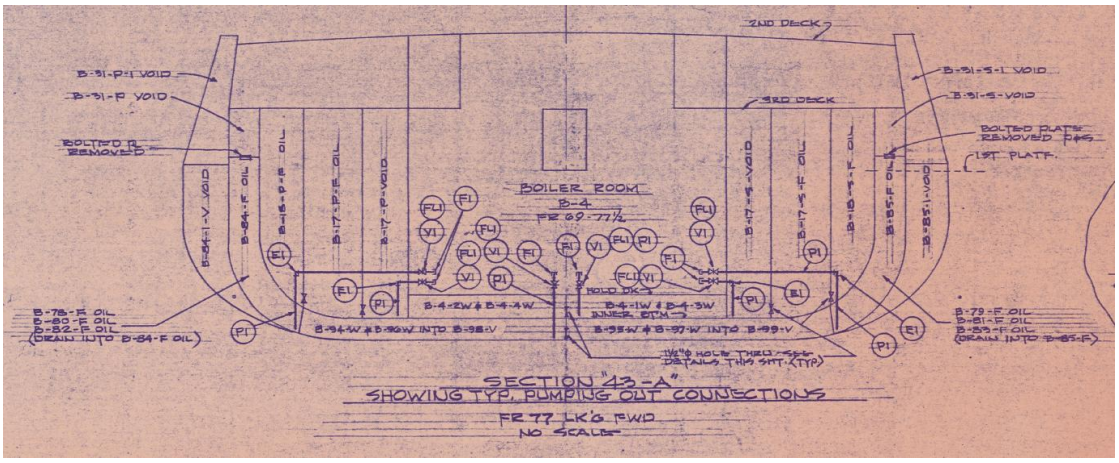


Figure 404 Typical Cross-Section Drawing of "Commonized" Pumping System Installed on Vessel

The vessel's pump inventory consists of the following:

- Eight (8) two-inch "Piranha" submersible pumps. These are portable and unless otherwise noted, get moved to where they are needed
    - Two (2) in D-12 (one of which is "permanently" installed)
    - Two (2) in Starboard blisters
    - One (1) in Port blister
    - One (1) in D-98
    - Two (2) - New pumps kept in reserve
- Three (3) three-inch pneumatic pumps that are staged and ready:
    - One (1) in Ammo passageway
    - One (1) in Engine Room
    - One (1) in D-12

The flood alarm system is reportedly "non-operational"; the sensors are not well placed and there may be no alarm claxon installed. 480 V AC outlets are installed throughout the ship as per the "Commonization" drawings. The pumps and discharge hoses are not in place to effect de-watering as per the "Communization" plan.

19 SILTING AT BERTH

The battleship TEXAS is basically aground in her present berth. Observations by the dive team showed that for both sides of the ship the vessel is basically aground from Frame No. 12 to Frame No. 120 with just the tops of the rolling chocks being seen on both sides (Figure 405). The bow forward of Frame No. 12 is sculpted out and can be clearly seen. Likewise, the stern after Frame No. 120 is generally clear of mud/debris.

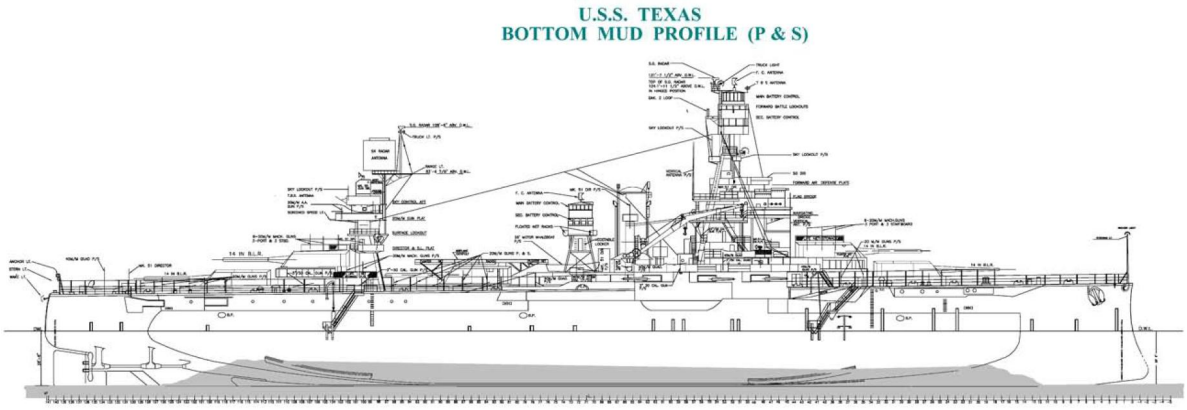


Figure 405 Bottom Mud Profile at Ship's Current Slip

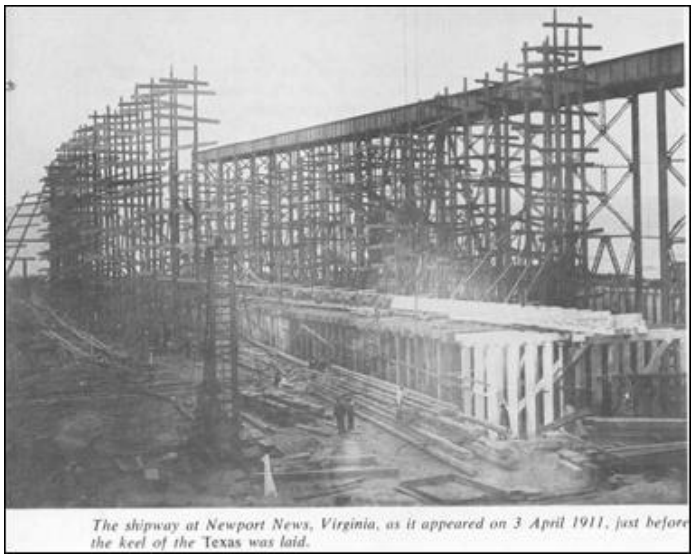
20 REFERENCES

Lombardi, J. W. (2010) Ultrasonic Testing Inspection and Corrosion Analysis of Hull and Mooring Clusters of Battleship TEXAS (BB-35), Construction Contract No. 101887 TPWD, Report Prepared for Texas Parks and Wildlife Department

Possehl, J. (2010) Battleship TEXAS (BB-35) Stability Assessment, Report Prepared for Texas Parks and Wildlife Department

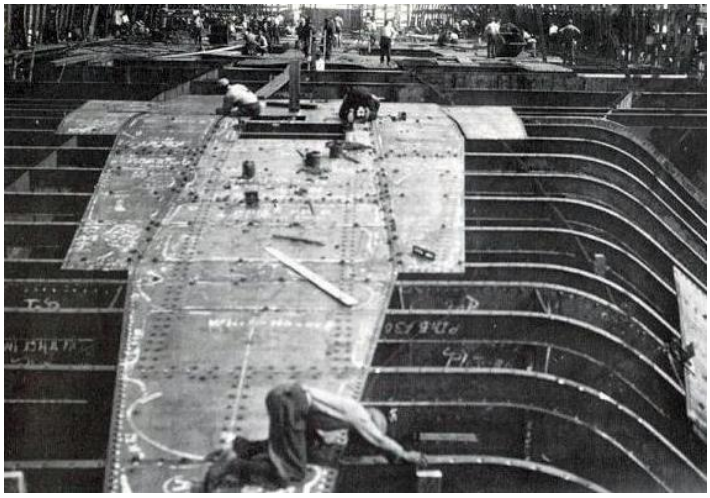
21 APPENDIX A (Vessel History)

The second Texas (Battleship No. 35) was laid down on 17 April 1911 at Newport News, Va., by the Newport News Shipbuilding Co.; launched on 18 May 1912; sponsored by Miss Claudia Lyon; and commissioned on 12 March 1914, Capt. Albert W. Grant in command.



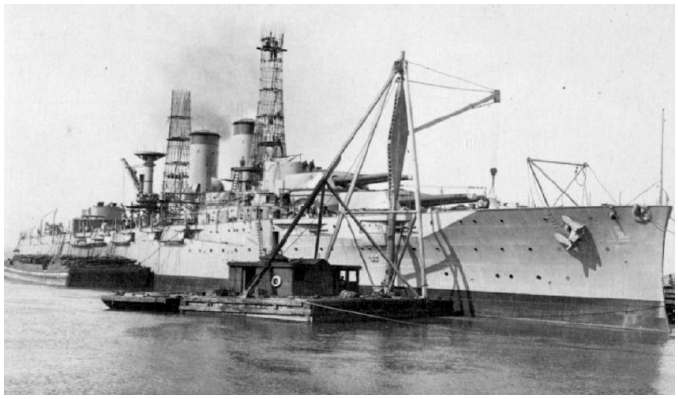
Slipway at Newport News Shipbuilding in 1911 where the Battleship TEXAS will be constructed.

On 24 March, 1914, *Texas* departed the Norfolk Navy Yard and set a course for New York. She made an overnight stop at Tompkinsville, N.Y., on the night of the 26th and 27th and entered the New York Navy Yard on the latter day. She spent the next three weeks there undergoing the installation of the fire control equipment.



Shipyard workers laying steel plate over the transverse frames covering the steering gear compartment.

During her stay in New York, President Woodrow Wilson ordered a number of ships of the Atlantic Fleet to Mexican waters in response to tension created when an overzealous detail of Mexican Federal troops detained an American boat crew at Tampico. The problem was quickly resolved locally, but fiery Rear

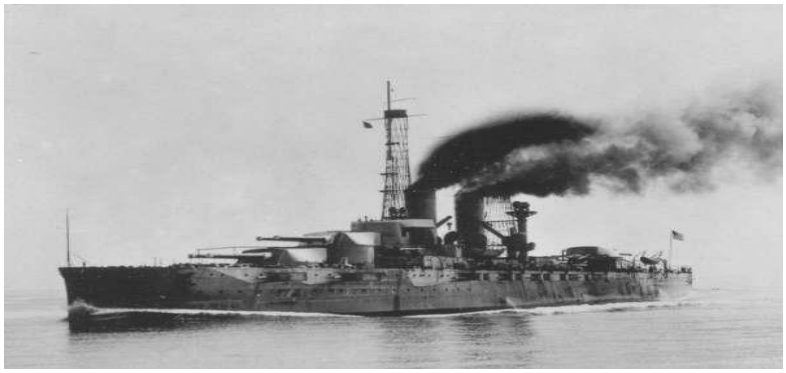


Battleship TEXAS at the fitting out berth just after commissioning.

Admiral Henry T. Mayo sought further redress by demanding an official disavowal of the act by the Huerta regime and a 21-gun salute to the American flag.

Unfortunately for Mexican-American relations, President Wilson apparently saw in the incident an opportunity to put pressure on a government he felt was undemocratic. On 20 April, Wilson placed the matter before the Congress and sent orders to Rear Admiral l Frank Friday Fletcher, commanding the naval force off the Mexican coast, instructing him to land a force at Veracruz and to seize the customs house there in retaliation for the celebrated "Tampico Incident." That action was carried out on the 21st and 22d.

Due to the intensity of the situation, when *Texas* put to sea on 13 May she headed directly to operational duty without benefit of the usual shakedown cruise and post-shakedown repair period. After a five-day stop at Hampton Roads between 14 and 19 May, she joined Rear Admiral Fletcher's force off Veracruz on the 26th. She remained in Mexican waters for just over two months, supporting the American forces ashore. On 8 August, she left Veracruz and set a course for Nipe Bay, Cuba, and thence steamed to New York where she entered the Navy Yard on 21 August.



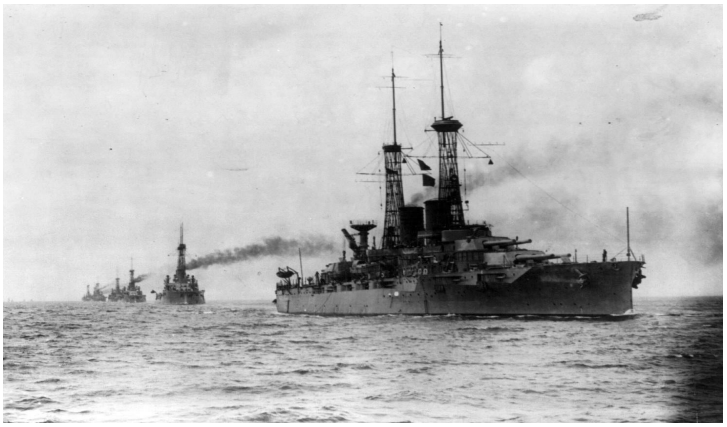
On sea trials, 1914.

The battleship remained there until 6 September when she returned to sea, joined the Atlantic Fleet, and settled into a schedule of normal fleet operations. In October, she returned to the Mexican coast. Later that month, *Texas* became station ship at Tuxpan, a duty that lasted until early November. The ship finally bade Mexico farewell at Tampico on 20 December and set a course for New York. The battleship entered the New York Navy Yard on 28 December and remained there undergoing repairs until 16 February 1916.

Upon her return to active duty with the fleet, *Texas* resumed a schedule of training operations along the New England coast and off the Virginia Capes alternated with winter fleet tactical and gunnery drills in the West Indies. That routine lasted just over two bears until the February-to-March crisis over unrestricted submarine warfare catapulted the United States into war with the Central Powers in April 1917.

The 6 April declaration of war found *Texas* riding at anchor in the mouth of the York River with the other Atlantic Fleet battleships. She remained in the Virginia Capes-Hampton Roads vicinity until mid-August conducting exercises and training naval armed-guard gun crews for service on board merchant ships.

In August, she steamed to New York for repairs, arriving at Base 10 on the 19th and entering the New York Navy Yard soon thereafter. She completed repairs on 26 September and got underway for Port Jefferson that same day. During the mid-watch on the 27th, however, she ran hard aground on Block Island. For three days, her crew lightened ship to no avail. On the 30th, tugs came to her assistance, and she finally backed clear. Hull damaged dictated a return to the yard, and the extensive repairs she required precluded her departure with Division 9 for the British Isles in November.



Battleship TEXAS leading elements of the U.S. Atlantic Fleet, Hampton Roads, 1917.

By December, she had completed repairs and moved south to conduct war games out of the York River. Mid-January 1918 found the battleship back at New York preparing for the voyage across the Atlantic. She departed New York on 30 January; arrived at Scapa F low in the Orkney Islands off the coast of Scotland on 11 February; and rejoined Division 9, by then known as the 6th Battle Squadron of Britain's Grand Fleet.

Texas' service with the Grand Fleet consisted entirely of convoy missions and occasional forays to reinforce the British squadron on blockade duty in the North Sea whenever German heavy units threatened. The fleet alternated between bases at Scapa Flow and at the Firth of Forth in Scotland. *Texas* began her mission only five days after her arrival at Scapa Flow where she sortied with the entire fleet to reinforce the 4th Battle Squadron, then on duty in the North Sea. She returned to Scapa Flow the next day and remained until 8 March when she put to sea on a convoy escort mission from which she returned on the 13th. *Texas* and her division mates entered the Firth of Forth on 12 April but got underway again on the 17th to escort a convoy

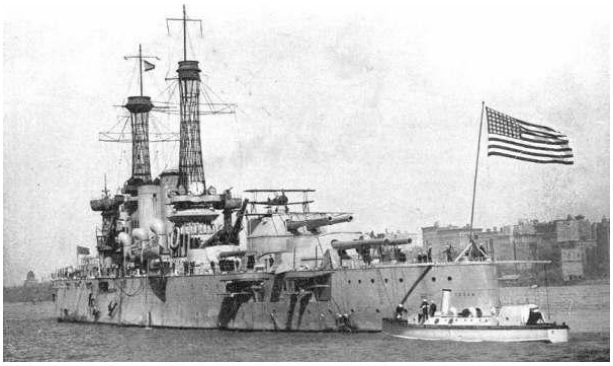
The American battleships returned to base on 20 April. Four days later, *Texas* again stood out to sea to support the 2d Battle Squadron the day after the German High Seas Fleet had sortied from Jade Bay toward the Norwegian coast to threaten an Allied convoy. Forward units caught sight of the retiring Germans on the 25th but at such extreme range that no possibility of bringing the enemy to battle existed. The Germans returned to their base that day, and the Grand Fleet; including *Texas*, did likewise on the next.

Texas and her division mates passed a relatively quiescent May in the Firth of Forth. On 9 June, she got underway with the other warships of the 6th Battle Squadron and headed back to the anchorage at Scapa Flow, arriving there the following day. Between 30 June and 2 July, *Texas* and her colleagues acted as escort for American minelayers adding to the North Sea mine barrage. After a two-day return to Scapa Flow, *Texas* put to sea with the Grand Fleet to conduct two days of tactical exercises and war games. At the conclusion of those drills on 8 July, the fleet entered the Firth of Forth. For the remainder of World War I, *Texas* and the other battleships of Division 9 continued to operate with the Grand Fleet as the 6th Battle Squadron. With the German Fleet increasingly more tied to its bases in the estuaries of the Jade and Ema Rivers, the American and British ships settled, more and more into a routine schedule of operations with little or no hint of combat operations. That state of affairs lasted until the armistice ended hostilities on 11 November 1918. On the night of 20 and 21 November, she accompanied the Grand Fleet to meet the surrendering German Fleet.

The two fleets rendezvoused about 40 miles east of May Island- located near the mouth of the Firth of Forth and proceeded together into the anchorage at Scapa Flow. Afterward, the American contingent moved to Portland, England, arriving there on 4 December.

Eight days later, *Texas* put to sea with Divisions 9 and 6 to meet President Woodrow Wilson embarked in GEORGE *Washington* on his way to the Paris Peace Conference. The rendezvous took place at about 0730 the following morning and provided an escort for the President into Brest, France, where the ships arrived at 1230 that afternoon. That evening, *Texas* and the other American battleships departed Brest for Portland where they stopped briefly on the 14th before getting underway to return to the United States. The warships arrived off Ambrose Light on Christmas Day 1918 and entered New York on the 26th.

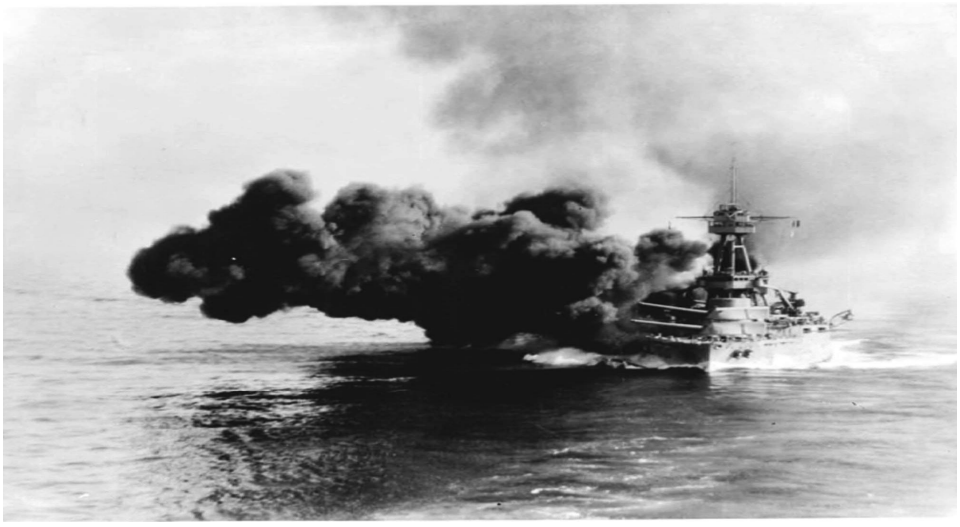
Following overhaul, *Texas* resumed duty with the Atlantic Fleet early in 1919. On 9 March, she became the first American battleship to carry an airplane when Lt. Comdr. Edward O. McDonnell flew a British-built Sopwith "Camel" off the warship. That summer, she was reassigned to the Pacific Fleet. On 17 July 1920, she was designated BB-35 as a result of the Navy's adoption of the alpha-numeric system of hull designations. *Texas* served in the Pacific until 1924 when she returned to the east coast for overhaul and to participate in a training cruise to European waters with Naval Academy midshipmen embarked. That fall, she conducted maneuvers as a unit of the Scouting Fleet.



Battleship TEXAS with flying off platform on Turret No.4, 1919.

In 1925, she entered the Norfolk Navy Yard for a major modernization over haul during which her cage masts were replaced with a single tripod foremast. She also received the very latest in fire control equipment. Following that overhaul, she resumed duty along the eastern seaboard and kept at that task until late in 1927 when she did a brief tour of duty in the Pacific between late September and early December.

Near the end of the year, *Texas* returned to the Atlantic and resumed normal duty with the Scouting Fleet. In January 1928, she transported President Herbert Hoover to Havana for the Pan-American conference and then continued on via the Panama Canal and the west coast to maneuvers with the fleet near Hawaii.



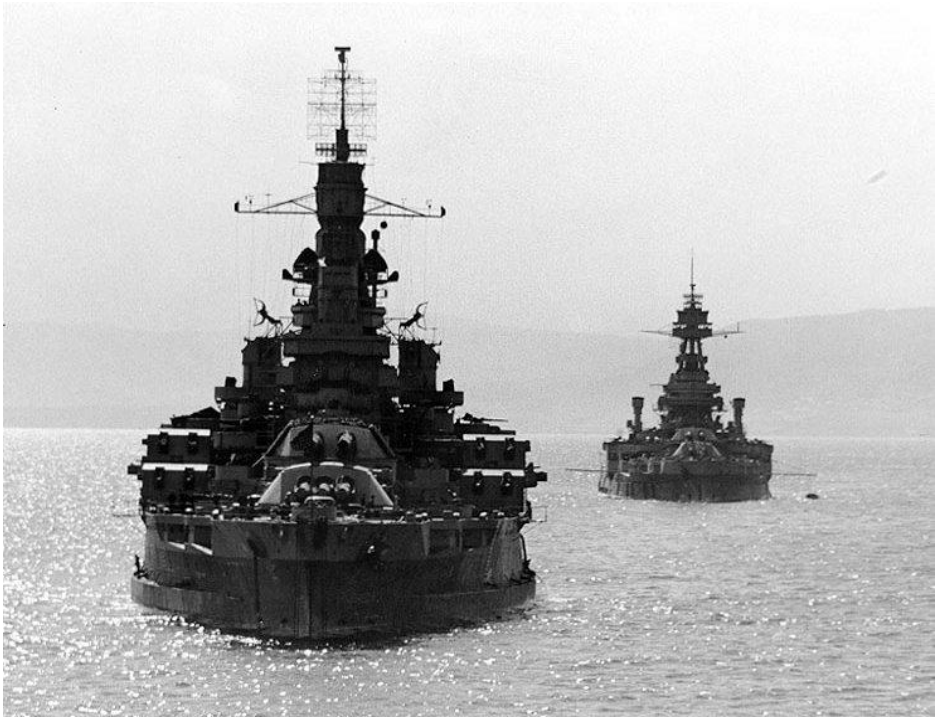
The newly overhauled Battleship TEXAS firing her broadside, 1928.

She returned to New York early in 1929 for her annual overhaul and had completed it by March when she began another brief tour of duty in the Pacific. She returned to the Atlantic in June and resumed normal duty with the Scouting Fleet. In April 1930, she took time from her operating schedule to escort SS *Leviathan* into New York when that ship returned from Europe carrying the delegation that had represented the United States at the London Naval Conference. In January 1931, she left the yard at New York as flagship of the United States Fleet and headed via the Panama Canal to San Diego, her home port for the next six years. During that period, she served first as flagship for the entire Fleet and, later, as flagship for Battleship Division (BatDiv) 1. She left the Pacific once during that time, in the summer of 1936, when she joined in a midshipman training cruise in the Atlantic. Upon completion of that assignment, the battleship immediately rejoined Battle Force in the Pacific.

In the summer of 1937, she once more was reassigned to the east coast, as the flagship of the Training Detachment, United States Fleet. Late in 1938 or early in 1939, the warship became flagship of the newly organized Atlantic Squadron, built around BatDiv 5. Through both organizational assignments, her labors were directed primarily to training missions, midshipman cruises, naval reserve drills, and training members of the Fleet Marine Force.

Soon after war broke out in Europe in September 1939, *Texas* began operating on the "neutrality patrol," established to keep the war out of the western hemisphere. Later, as the United States moved toward more active support of the Allied cause, the warship began convoying ships carrying Lend-Lease material to Great Britain. Sunday, 7 December 1941, found the battleship at Casco Bay, Maine, undergoing a rest and relaxation period following three months of watch duty at Argentia, Newfoundland. After 10 days of Casco Bay; she returned to Argentia and remained there until late January 1942 when she got underway to escort a convoy to England. After delivering her charges, the battleship patrolled waters near Iceland until March when she returned home. F or the next six months, she continued convoy-escort missions. Her destinations were various.

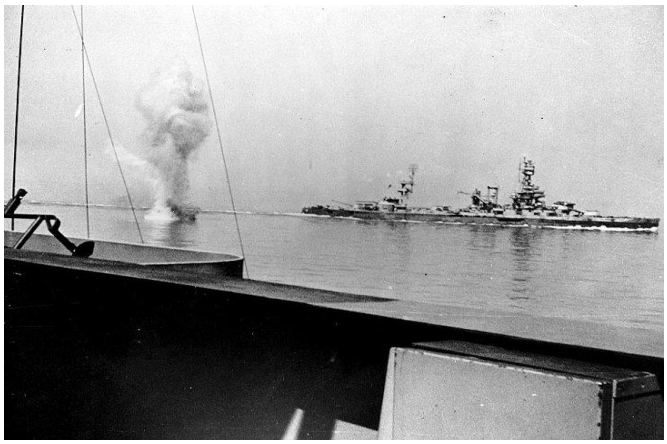
On one occasion, she escorted Guadalcanal-bound marines as far as Panama. On another, the warship screened service troops to Freetown, Sierra Leone, on the west coast of Africa. More frequently, she made voyages to and from Great Britain escorting both cargo- and troop-carrying ships.



At Belfast Lough, May 1944. Battleship TEXAS is at right.

On 23 October, *Texas* embarked upon her first major combat operation when she sortied with Task Group (TG) 34.8, the Northern Attack Group for Operation "Torch," the invasion of North Africa. The objective assigned to this group was Mehedia near Port Lyautey and the port itself. The ships arrived off the assault beaches early in the morning of 8 November and began preparations for the invasion. When the troops went ashore, *Texas* did not come immediately into action to support them. At that point in the war, amphibious warfare doctrine was still embryonic; and many did not recognize the value of a pre-landing bombardment. Instead, the Army insisted upon attempting surprise. *Texas* finally entered the fray early in the afternoon when the Army requested her to destroy an ammunition dump near Port Lyautey. For the next week, she contented herself with cruising up and down the Moroccan coast delivering similar, specific, call-fire missions. Thus, unlike in later operations, she expended only 273 rounds of 14-inch and 6 rounds of 5-inch. During her short stay, some of her crew briefly went ashore to assist in salvaging some of the shipping sunk in the harbor. On 16 November, she departed North Africa and headed for home in company with *Savannah* (CL-42), *Sangamon* (ACV-26), *Kennebec* (AO-86), four transports, and seven destroyers.

Throughout 1943 *Texas* carried out the familiar role of convoy escort. With New York as her home port, she made numerous transatlantic voyages to such places as Casablanca and Gibraltar, as well as frequent visits to ports in the British Isles. That routine continued into 1944 but ended in April of that year when, at the European end of one such mission, she remained at the Clyde estuary in Scotland and began training for the invasion of Normandy. That warm-up period lasted about seven weeks at the end of which she departed the Clyde and traveled down the Irish Sea and around the southern coast of England to arrive off the Normandy beaches on the night of 5 and 6 June.



A heavy German coast artillery shell falls between *Texas* (BB-35), in the background, and *Arkansas* (BB-33), while the two battleships were engaging *Battery Hamburg* during the bombardment of Cherbourg, France, 25 June 1944. Photographed from *Arkansas*.

At about 0440 on the morning of the 6th, the battleship closed the Normandy coast to a point some 12,000 yards offshore near Pointe du Hoc. At 0650, *Texas* began churning up the coastal landscape with her 14-inch salvoes. Meanwhile, her secondary battery went to work on another target on the western end of "Omaha" beach, a ravine laced with strong points to defend an exit road. Later, under control of airborne spotters, she moved her major-caliber fire inland to interdict enemy reinforcement activities and to destroy batteries and other strong points farther inland.

By noon, she closed the beach to about a range of 3,000 yards to fire upon snipers and machinegun nests hidden in a defile just off the beach. At the conclusion of that mission, the warship took an enemy antiaircraft battery located west of Vierville under fire.

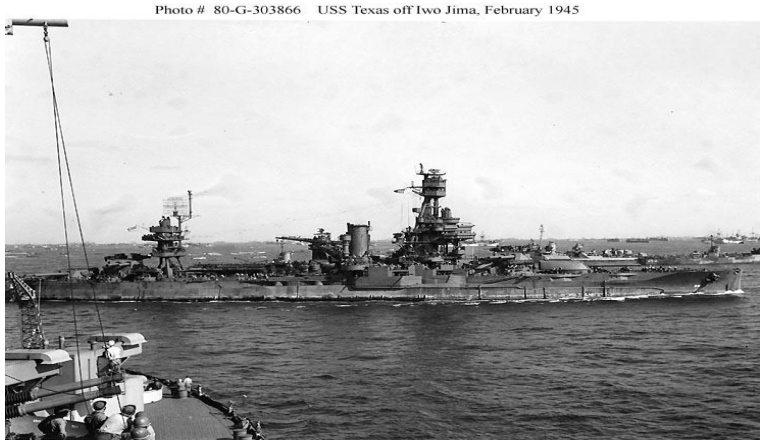
The following morning, her main battery rained 14-inch shells on the enemy-held towns of Surrain and Trevieres to break up German troop concentrations. That evening, she bombarded a German mortar battery which had been shelling the beach. Not long after midnight, German planes attacked the ships offshore, and one of them swooped in low on *Texas*' starboard quarter. Her antiaircraft batteries opened up immediately but failed to score on the intruder. On the morning of 8 June, her guns fired on Signee , then on a shore battery, and finally on Trevieres once more.

After that, she retired to Plymouth to rearm, returning to the French coast on the 11th. From then until the 15th, she supported the Army in its advance inland, However, by the latter day, the troops had advanced beyond the range of her guns; and the battleship moved on to another mission.

On the morning of 26 June, *Texas* closed in on the vital port of Cherbourg and, with *Arkansas* (BB-33), opened fire upon various fortifications and batteries surrounding the town. The guns on shore returned fire immediately and, at about 1230, succeeded in straddling *Texas*. The battleship, however, continued her firing runs in spite of shell geysers blossoming about her. The enemy gunners were stubborn and good. At 1316 a 280-millimeter shell slammed into her fire control tower, killed the helmsman, and wounded nearly everyone on the navigation bridge. *Texas*' commanding officer, Capt. Baker, miraculously escaped unhurt and quickly had the bridge cleared. The warship herself continued to deliver her 14-inch shells in spite of damage and casualties. Some time later, another shell struck the battleship. That one, a 240-millimeter armor-piercing shell, crashed through the port bow, entered a compartment located below the wardroom, but failed to explode. Throughout the three-hour duel , the Germans straddled and near-missed *Texas* over 65 times, but she continued her mission until 1600 when, upon orders to that effect, she retired.

Texas underwent repairs at Plymouth, England, and then drilled in preparation for the invasion of southern France. On 16 July , she departed Belfast Lough and headed for the Mediterranean. After stops at Gibraltar and Oran in Algeria, the battleship rendezvoused with three French destroyers off Bizerte, Tunisia, and set a course for the Riviera coast of France. She arrived off St. Tropez during the night of 14 and 15 July. At 0444, she moved into position for the pre-landing bombardment and, at 0651, opened up on her first target, a battery of five 155- millimeter guns. Due to the fact that the troops ashore moved inland rapidly against light resistance, she provided fire support for the assault for only two days. *Texas* departed the southern coast of France on the evening of 16 August. After a stop at Palermo, Sicily, she left the Mediterranean and headed for New York where she arrived on 14 September 1944.

At New York, *Texas* underwent a 36-day repair period during which the barrels on her main battery were replaced. After a brief refresher cruise, she departed New York in November and set a course, via the Panama Canal, for the Pacific. She made a stop at Long Beach, Calif., and then continued on to Oahu. She spent Christmas at Pearl Harbor and then conducted maneuvers in the Hawaiian Islands for about a month at the end of which she steamed to Ulithi Atoll. She departed Ulithi on 10 February 1945, s topped in the Marianas for two days' invasion rehearsals, and then set a course for Iwo Jima. She arrived off the target on 16 February, three days before the scheduled assault. She spent those three days pounding enemy defenses on Iwo Jima in preparation for the landings. After the troops stormed ashore on the 19th, *Texas* switched roles and began delivering support and call fire. She remained off Iwo Jima for almost a fortnight, helping the marines subdue a well dug-in and stubborn Japanese garrison.



Battleship TEXAS off Iwo Jima, February 1945.

Though Iwo Jima was not declared secured until 16 March, *Texas* cleared the area late in February and returned to Ulithi early in March to prepare for the Okinawa operation. She departed Ulithi with TF 54, the gunfire support unit, on 21 March and arrived in the Ryukyus on the 26th. *Texas* did not participate in the occupation of the islands and roadstead at Kerama Retto carried out on the 26th but moved in on the main objective instead, beginning the pre-landing bombardment that same day. For the next six days, she delivered 14-inch salvoes to prepare the way for the Army and the Marine Corps. Each evening, she retired from her bombardment position close to the Okinawan shore only to return the next day and resume her poundings. The enemy ashore, preparing for a defense-in-depth strategy as at Iwo Jima, made no answer. Only his air units provided a response, sending several kamikaze raids to harass the bombardment group. *Texas* escaped damage during those small attacks. After six days of aerial and naval bombardment, the ground troops' turn came on 1 April. They stormed ashore against initially light resistance. For almost two months, *Texas* remained in Okinawan waters providing gunfire support for the troops ashore and fending of the enemy aerial assault. In performing the latter mission, she claimed one kamikaze kill on her own and three assists.

Battleship TEXAS alongside TULAGA (AO-62) 15 April 1945.

Late in May, *Texas* retired to Leyte in the Philippines and remained there until after the Japanese capitulation on 15 August. She returned to Okinawa toward the end of August and stayed in the Ryukyus until 23 September. On that day, she set a course for the United States with troops embarked. The battleship delivered her passengers to San Pedro, Calif., on 15 October. she celebrated Navy Day there on 27 October and then resumed her mission bringing American troops home. She made two round-trip voyages between California and Oahu in November and a third in late December.

On 21 January 1946, the warship departed San Pedro and steamed via the Panama Canal to Norfolk where she arrived on 13 February. She soon began preparations for inactivation. In June, she was moved to Baltimore, Md., where she remained until the beginning of 1948. *Texas* was towed to San Jacinto State Park in *Texas* where she was decommissioned on 21 April 1948 and turned over to the state of Texas to serve as a permanent memorial. Her name was struck from the Navy list on 30 April 1948.

Texas (BB-35) earned five battle stars during World War II. Transcribed and edited by: Larry W. Jewell [3].

[3] Dictionary of American Naval Fighting Ships, US Naval Historical Center, 1959-1991.

22 APPENDIX B ULTRASONIC TESTING (UT) READINGS FOR BOTTOM TANKAGE PLATING, SCANTLINGS AND KEEL

Ultrasonic Testing (UT) reading of the vessel's shell plating was undertaken during the inspection of the ship. The important underwater shell plate areas were inspected for the centerline tanks. Readings were taken and compared to the microfilm 'Shell Plate Expansion Plan' as built from Battleship TEXAS BB-35's sister-ship NEW YORK (BB-34). This series of plans were utilized for the original baseline data as there is no Battleship TEXAS Shell Plate Expansion Plan onboard or at the National Archives. The quality of the microfilm is very poor making portions of the plans unreadable, but there is enough good information for the concerned tankage areas.

A Krautkramer-Branson DMS s/n 00005YLM thickness gage, and KBA560 dual element probe transducer were used for the UT measurements. The calibration standard was 5-step steel block. The material velocity was 5800 m/s (.2332-.2341 in/us) and the measurement range was ¼ in. – 2 in. The measurement mode was Dual-multi (through coatings) and data was recorded onboard. The ambient temperature varied from 55 - 72 degrees (F). The instrument and calibration standards were allowed to acclimatize to local conditions before calibration and measurement. The instrument calibration was rechecked after each series of readings were completed.

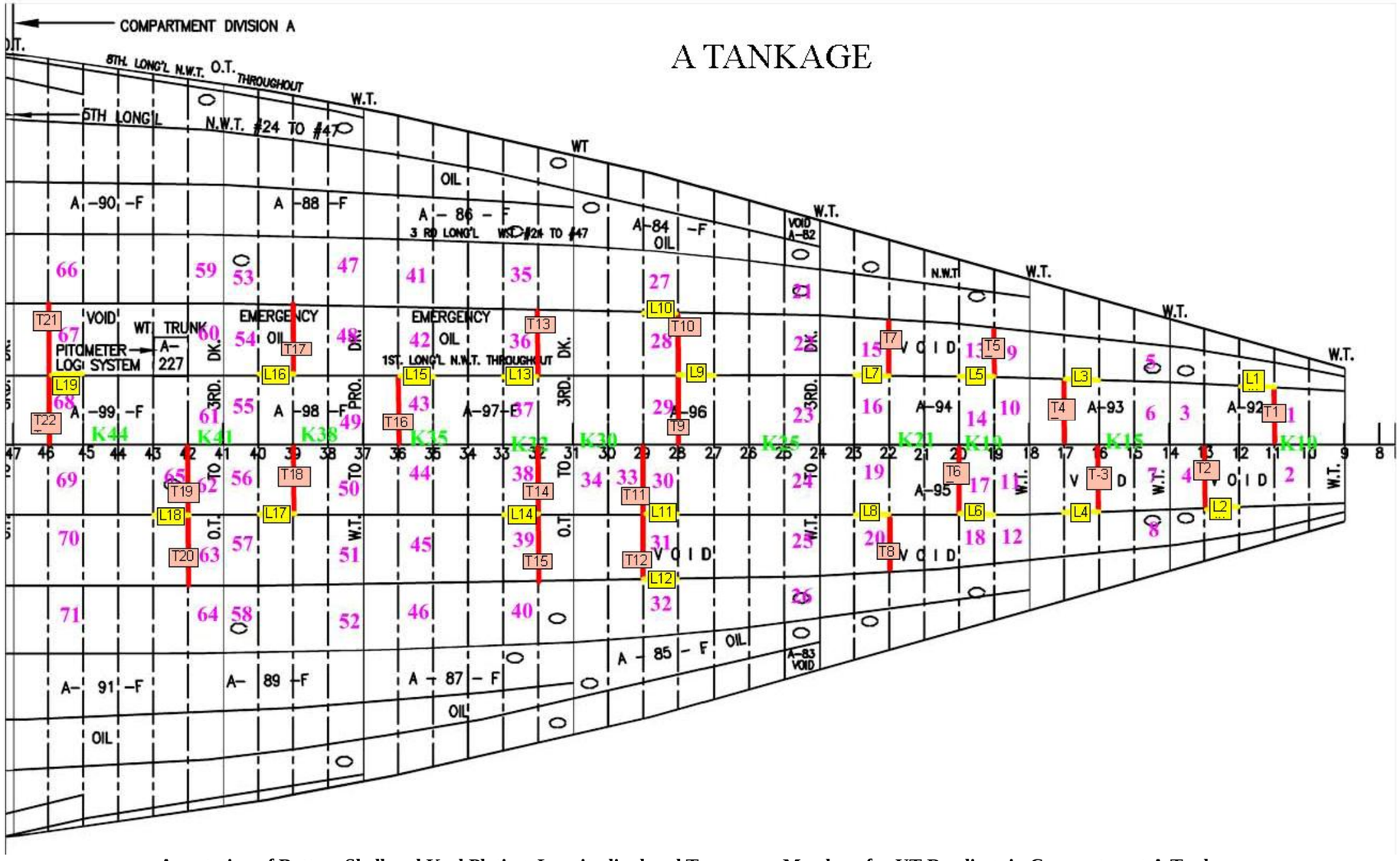
In the following annotated drawings (Compartments "A" through "D" shown separately), the location of the Bottom Shell Plating readings are sequentially numbered and are shown in **MAGENTA**. The UT readings are provided in tables following the annotated drawing.

The location and numbering of the Keel Plate readings on the centerline are shown in **GREEN** and correspond to the Frame number recorded on the drawings. The UT readings are provided in tables following the annotated drawing.

The location of the Transverse Frames Plating readings are marked in **RED** on the drawings. The UT readings are provided in tables following the annotated drawing.

The location and numbering of the Longitudinal Plating readings are marked in **YELLOW** on the drawings. The UT readings are provided in tables following the annotated drawing.

22.1 COMPARTMENT A



Annotation of Bottom Shell and Keel Plating, Longitudinal and Transverse Members for UT Readings in Compartment A Tankage

Compartment A Tankage - Ultrasonic Testing Readings of Transverse Members

Transverse Member Notation	Compartment Division	Original Weight (lbs)	Original Thickness (in)	Measured Thickness (in)	Percentage Wastage
T1	A-92	12	0.294	0.225	23.5%
T2	A-92	12	0.294	0.199	32.3%
T3	A-93	12	0.294	0.192	34.7%
T4	A-93	12	0.294	0.233	20.7%
T5	A-94	12	0.294	0.222	24.5%
T6	A-95	12	0.294	0.200	32.0%
T7	A-94	12	0.294	0.190	35.4%
T8	A-95	12	0.294	0.165	43.9%
T9	A-96	12	0.294	0.234	20.4%
T10	A-96	12	0.295	0.199	32.5%
T11	A-96	12	0.294	0.205	30.3%
T12	A-96	12	0.294	0.158	46.3%
T13	A-97	12	0.294	0.251	14.6%
T14	A-97	12	0.294	0.187	36.4%
T15	A-97	12	0.294	0.224	23.8%
T16	A-97	12	0.294	0.128	56.5%
T17	A-98	15	0.368	0.175	52.4%
T18	A-98	15	0.368	0.168	54.3%
T19	A-99	15	0.368	0.190	48.4%
T20	A-99	15	0.368	0.229	37.8%
T21	A-99	15	0.368	0.179	51.4%
T22	A-99	15	0.368	0.160	56.5%

Compartment A Tankage - Ultrasonic Testing Readings of Longitudinal Members

Longitudinal Member Notation	Compartment Division	Original Weight (lbs)	Original Thickness (in)	Measured Thickness (in)	Percentage Wastage
L1	A-92	15	0.368	0.300	18.5%
L2	A-92	15	0.368	0.259	29.6%
L3	A-93	15	0.368	0.299	18.8%
L4	A-93	15	0.368	0.322	12.5%
L5	A-94	15	0.368	0.345	6.3%
L6	A-95	15	0.368	0.279	24.2%
L7	A-94	15	0.368	0.300	18.5%
L8	A-95	15	0.368	0.325	11.7%
L9	A-96	15	0.368	0.245	33.4%
L10	A-96	15	0.368	0.315	14.4%
L11	A-96	15	0.368	0.265	28.0%
L12	A-96	15	0.368	0.243	34.0%
L13	A-97	15	0.368	0.300	18.5%
L14	A-97	15	0.368	0.229	37.8%
L15	A-97	17 1/2	0.429	0.310	27.7%
L16	A-98	17 1/2	0.429	0.319	25.6%
L17	A-98	17 1/2	0.429	0.256	40.3%
L18	A-99	17 1/2	0.429	0.299	30.3%
L19	A-99	17 1/2	0.429	0.239	44.3%

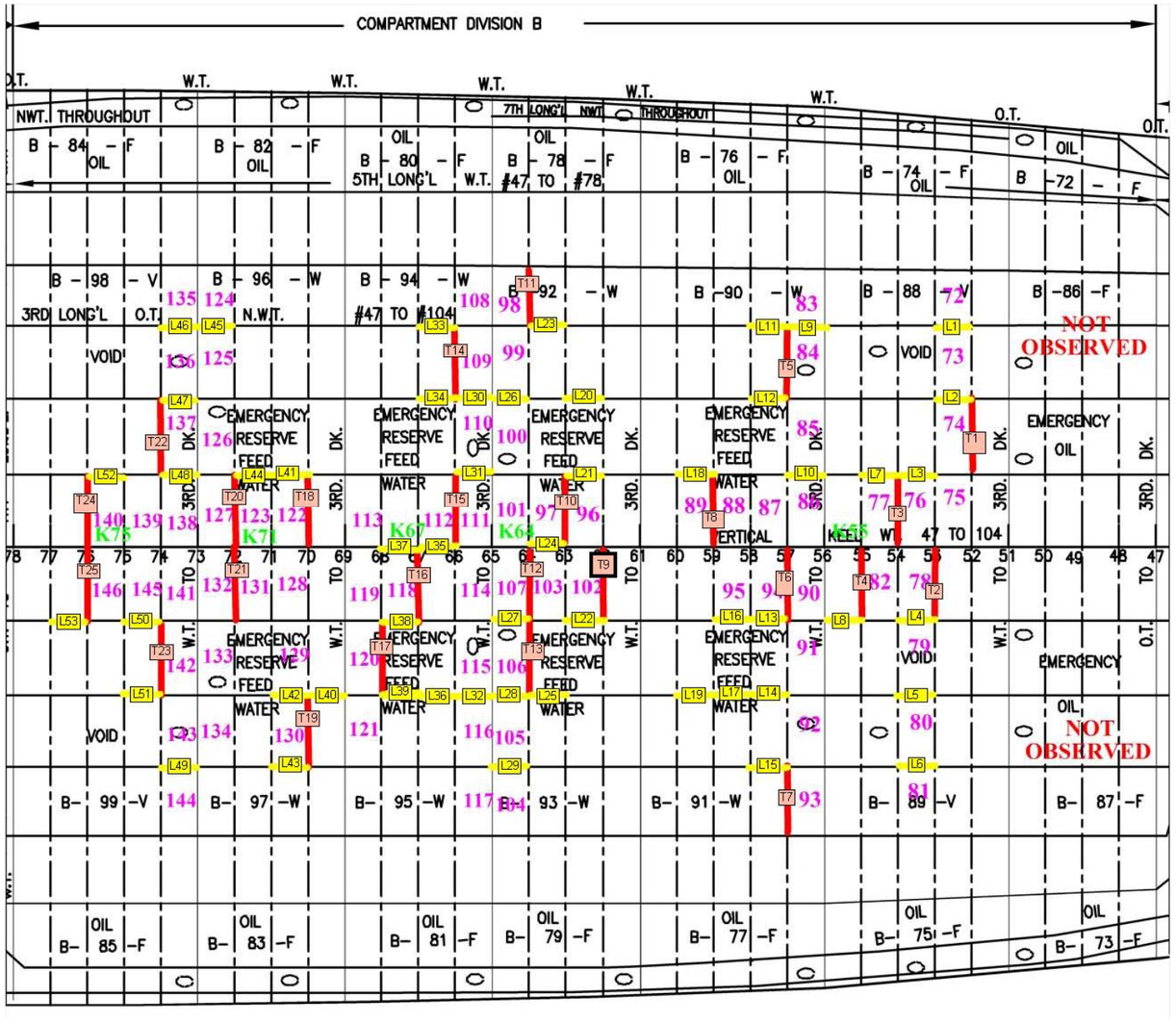
Compartment A Tankage - Ultrasonic Testing Readings of Keel Plating

Keel Plate Notation	Original Weight (lbs)	Original Thickness (in)	Measured Thickness (in)	Percentage Wastage
K10	30	0.735	0.379	48.44%
K15	30	0.735	0.444	39.59%
K19	30	0.735	0.478	34.97%
K21	30	0.735	0.390	46.94%
K25	30	0.735	0.250	65.99%
K30	30	0.735	0.467	36.46%
K32	30	0.735	0.652	11.29%
K35	30	0.735	0.489	33.47%
K38	30	0.735	0.322	56.19%
K41	30	0.735	0.300	59.18%
K44	30	0.735	0.404	45.03%

Compartment A Tankage - Ultrasonic testing readings of Bottom Shell Plating

Shell Plate Notation	Compartment Division	Original Weight (lbs)	Original Thickness (in)	Measured Thickness (in)	Percentage Wastage
1	A-92	20	0.490	0.365	25.5%
2	A-92	20	0.490	0.229	53.3%
3	A-92	20	0.490	0.389	20.6%
4	A-92	20	0.490	0.400	18.4%
5	A-93	20	0.490	0.390	20.4%
6	A-93	20	0.490	0.225	54.1%
7	A-93	20	0.490	0.215	56.1%
8	A-93	20	0.490	0.343	30.0%
9	A-94	20	0.490	0.378	22.9%
10	A-94	20	0.490	0.300	38.8%
11	A-94	20	0.490	0.271	44.7%
12	A-94	20	0.490	0.222	54.7%
13	A-94	20	0.490	0.315	35.7%
14	A-94	20	0.490	0.305	37.8%
15	A-94	20	0.490	0.322	34.3%
16	A-94	20	0.490	0.378	22.9%
17	A-95	20	0.490	0.400	18.4%
18	A-95	20	0.490	0.415	15.3%
19	A-95	20	0.490	0.420	14.3%
20	A-95	20	0.490	0.389	20.6%
21	A-96	20	0.490	0.237	51.6%
22	A-96	20	0.490	0.229	53.3%
23	A-96	20	0.490	0.305	37.8%
24	A-96	20	0.490	0.339	30.8%
25	A-96	20	0.490	0.299	39.0%
26	A-96	20	0.490	0.400	18.4%
27	A-96	20	0.490	0.350	28.6%
28	A-96	20	0.490	0.344	29.8%
29	A-96	20	0.490	0.210	57.1%
30	A-96	20	0.490	0.201	59.0%
31	A-96	20	0.490	0.289	41.0%
32	A-96	20	0.490	0.273	44.3%
33	A-96	20	0.490	0.312	36.3%
34	A-96	20	0.490	0.333	32.0%
35	A-96	20	0.490	0.349	28.8%
36	A-97	20	0.490	0.401	18.2%
37	A-97	20	0.490	0.425	13.3%
38	A-97	22 1/2	0.551	0.343	37.7%
39	A-97	22 1/2	0.551	0.300	45.6%
40	A-97	22 1/2	0.551	0.291	47.2%
41	A-97	22 1/2	0.551	0.277	49.7%
42	A-97	22 1/2	0.551	0.240	56.4%
43	A-97	22 1/2	0.551	0.232	57.9%
44	A-97	22 1/2	0.551	0.278	49.5%
45	A-97	22 1/2	0.551	0.343	37.7%
46	A-97	22 1/2	0.551	0.340	38.3%
47	A-98	24	0.588	0.510	13.3%
48	A-98	24	0.588	0.444	24.5%
49	A-98	24	0.588	0.305	48.1%
50	A-98	24	0.588	0.329	44.0%
51	A-98	24	0.588	0.410	30.3%
52	A-98	24	0.588	0.321	45.4%
53	A-98	24	0.588	0.333	43.4%
54	A-98	24	0.588	0.301	48.8%
55	A-98	24	0.588	0.420	28.6%
56	A-98	24	0.588	0.434	26.2%
57	A-98	24	0.588	0.310	47.3%
58	A-98	24	0.588	0.345	41.3%
59	A-99	24	0.588	0.378	35.7%
60	A-99	24	0.588	0.377	35.9%
61	A-99	24	0.588	0.235	60.0%
62	A-99	24	0.588	0.401	31.8%
63	A-99	24	0.588	0.329	44.0%
64	A-99	24	0.588	0.333	43.4%
65	A-99	26	0.637	0.310	51.3%
66	A-99	24	0.588	0.286	51.4%
67	A-99	24	0.588	0.218	62.9%
68	A-99	24	0.588	0.333	43.4%
69	A-99	24	0.588	0.378	35.7%
70	A-99	24	0.588	0.320	45.6%
71	A-99	26	0.637	0.289	54.6%

22.2 COMPARTMENT B



Annotation of Bottom Shell and Keel Plating, Longitudinal and Transverse Members for UT Readings in Compartment B Tankage

Compartment B Tankage - Ultrasonic Testing Readings of Transverse Members

Transverse Member Notation	Compartment Division	Original Weight (lbs)	Original Thickness (in)	Measured Thickness (in)	Percentage Wastage
T1	B-88V	15	0.368	0.297	19.3%
T2	B-89V	15	0.368	0.246	33.2%
T3	B-88V	15	0.368	0.221	39.9%
T4	B-89V	15	0.368	0.197	46.5%
T5	B-90W	15	0.368	0.147	60.1%
T6	B-91W	15	0.368	0.222	39.7%
T7	B-91W	15	0.368	0.301	18.2%
T8	B-90W	15	0.368	0.252	31.5%
T9	B-93W	15	0.368	0.178	51.6%
T10	B-92W	15	0.368	0.167	54.6%
T11	B-92W	15	0.368	0.177	51.9%
T12	B-93W	15	0.368	0.212	42.4%
T13	B-93W	15	0.368	0.181	50.8%
T14	B-94W	15	0.368	0.202	45.1%
T15	B-94W	15	0.368	0.221	39.9%
T16	B-95W	15	0.368	0.161	56.3%
T17	B-95W	15	0.368	0.150	59.2%
T18	B-96W	15	0.368	0.213	42.1%
T19	B-97W	15	0.368	0.167	54.6%
T20	B-96W	15	0.368	0.243	34.0%
T21	B-97W	15	0.368	0.219	40.5%
T22	B-98V	15	0.368	0.200	45.7%
T23	B-99V	15	0.368	0.178	51.6%
T24	B-98V	15	0.368	0.231	37.2%
T25	B-99V	15	0.368	0.243	34.0%

Compartment B Tankage - Ultrasonic Testing Readings of Keel Plating

Keel Plating Notation	Original Weight (lbs)	Original Thickness (in)	Measured Thickness (in)	Percentage Wastage
K55	30	0.745	0.379	49.1%
K64	30	0.735	0.299	59.3%
K67	30	0.735	0.255	65.3%
K71	30	0.735	0.378	48.6%
K78	30	0.735	0.290	60.5%

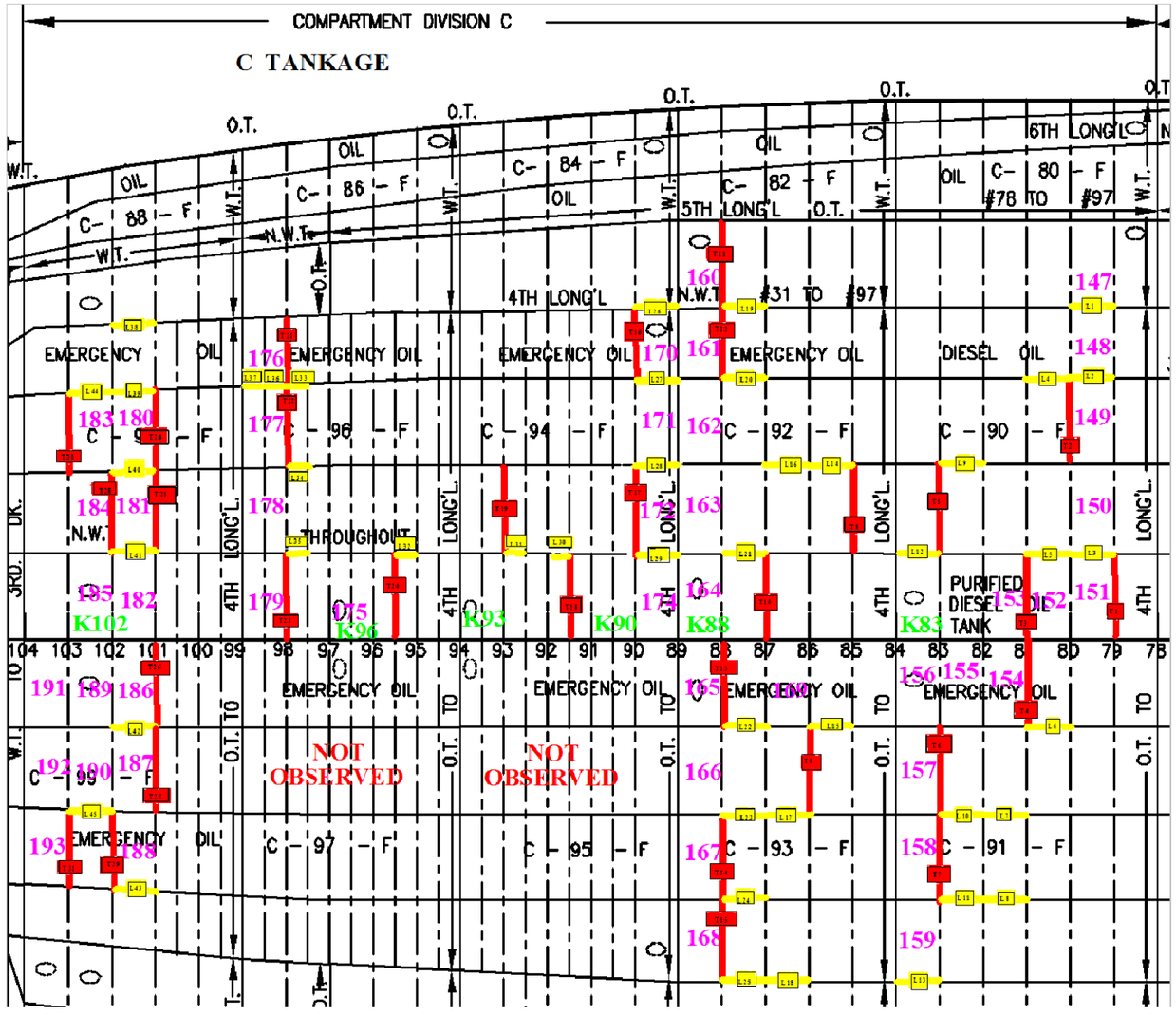
Compartment B Tankage - Ultrasonic Testing Readings of Longitudinal Members

Longitudinal Member Notation	Compartment Division	Original Weight (lbs)	Original Thickness (in)	Measured Thickness (in)	Percentage Wastage
L1	B-88V	20	0.490	0.225	54.1%
L2	B-88V	20	0.490	0.257	47.6%
L3	B-88V	20	0.490	0.241	50.8%
L4	B-89V	20	0.490	0.192	60.8%
L5	B-89V	20	0.490	0.221	54.9%
L6	B-89V	20	0.490	0.199	59.4%
L7	B-88W	20	0.490	0.148	69.8%
L8	B-89W	20	0.490	0.267	45.5%
L9	B-90W	20	0.490	0.312	36.3%
L10	B-90W	20	0.490	0.289	41.0%
L11	B-90W	20	0.490	0.331	32.4%
L12	B-90W	20	0.490	0.277	43.5%
L13	B-91W	20	0.490	0.177	63.9%
L14	B-91W	20	0.490	0.225	54.1%
L15	B-91W	20	0.490	0.187	61.8%
L15	B-91W	20	0.490	0.222	54.7%
L16	B-91W	20	0.490	0.199	59.4%
L17	B-90W	20	0.490	0.265	45.9%
L17	B-91W	20	0.490	0.221	54.9%
L18	B-92W	20	0.490	0.185	62.2%
L19	B-92W	20	0.490	0.300	38.8%
L20	B-93W	20	0.490	0.188	61.6%
L21	B-92W	20	0.490	0.205	58.2%
L22	K-63	20	0.490	0.310	36.7%
L23	B-93W	20	0.490	0.266	45.7%
L24	B-92W	20	0.490	0.299	39.0%
L25	B-93W	20	0.490	0.231	52.9%
L26	B-93W	20	0.490	0.155	68.4%
L27	B-93W	20	0.490	0.231	52.9%
L28	B-94W	20	0.490	0.311	36.5%
L29	B-94W	20	0.490	0.277	43.5%
L30	B-95W	20	0.490	0.300	38.8%
L31	B-94W	20	0.490	0.313	36.1%
L32	B-94W	20	0.490	0.221	54.9%
L33	K-66	20	0.490	0.323	34.1%
L34	B-95W	20	0.490	0.277	43.5%
L35	K-66	20	0.490	0.212	56.7%
L36	B-95W	20	0.490	0.300	38.8%
L37	B-95W	20	0.490	0.296	39.6%
L38	B-96W	20	0.490	0.300	38.8%
L39	B-97W	20	0.490	0.255	48.0%
L40	B-97W	20	0.490	0.267	45.5%
L41	B-96W	20	0.490	0.225	54.1%
L42	B-96W	20	0.490	0.378	22.9%
L43	B-98V	20	0.490	0.265	45.9%
L44	B-98V	20	0.490	0.234	52.2%
L45	B-98V	20	0.490	0.210	57.1%
L45	B-99V	20	0.490	0.225	54.1%
L46	B-99V	20	0.490	0.231	52.9%
L47	B-99V	20	0.490	0.257	47.6%
L48	B-98V	20	0.490	0.298	39.2%
L50	B-99V	20	0.490	0.231	52.9%

Compartment B Tankage - Ultrasonic Testing Readings of Bottom Shell Plating

Bottom Plating Notation	Compartment Division	Original Weight (lbs)	Original Thickness (in)	Measured Thickness (in)	Percentage Wastage
72	B-88V	26	0.637	0.454	28.7%
73	B-88V	26	0.637	0.410	35.6%
74	B-88V	26	0.637	0.378	40.7%
75	B-88V	26	0.637	0.352	44.7%
76	B-88V	26	0.637	0.314	50.7%
77	B-88V	26	0.637	0.389	38.9%
78	B-89V	26	0.637	0.400	37.2%
79	B-89V	26	0.637	0.358	43.8%
80	B-89V	26	0.637	0.299	53.1%
81	B-89V	26	0.637	0.236	63.0%
82	B-89V	26	0.637	0.250	60.8%
83	B-90W	26	0.637	0.389	38.9%
84	B-90W	26	0.637	0.301	52.7%
85	B-90W	26	0.637	0.389	38.9%
86	B-90W	26	0.637	0.392	38.5%
87	B-90W	26	0.637	0.410	35.6%
88	B-90W	26	0.637	0.444	30.3%
89	B-90W	26	0.637	0.450	29.4%
90	B-91W	26	0.637	0.347	45.5%
91	B-91W	26	0.637	0.319	49.9%
92	B-91W	26	0.637	0.444	30.3%
93	B-91W	26	0.637	0.425	33.3%
94	B-91W	26	0.637	0.439	31.1%
95	B-91W	26	0.637	0.454	28.7%
96	B-92W	26	0.637	0.329	48.4%
97	B-92W	26	0.637	0.377	40.8%
98	B-92W	26	0.637	0.400	37.2%
99	B-92W	26	0.637	0.416	34.7%
100	B-92W	26	0.637	0.515	19.2%
101	B-92W	26	0.637	0.489	23.2%
102	B-93W	26	0.637	0.365	42.7%
103	B-93W	26	0.637	0.300	52.9%
104	B-93W	26	0.637	0.292	54.2%
105	B-93W	26	0.637	0.300	52.9%
106	B-93W	26	0.637	0.312	51.0%
107	B-93W	26	0.637	0.417	34.5%
108	B-94W	26	0.637	0.400	37.2%
109	B-94W	26	0.637	0.375	41.1%
110	B-94W	26	0.637	0.300	52.9%
111	B-94W	26	0.637	0.319	49.9%
112	B-94W	26	0.637	0.299	53.1%
113	B-94W	26	0.637	0.276	56.7%
114	B-95W	26	0.637	0.229	64.1%
115	B-95W	26	0.637	0.230	63.9%
116	B-95W	26	0.637	0.278	56.4%
117	B-95W	26	0.637	0.402	36.9%
118	B-95W	26	0.637	0.420	34.1%
119	B-95W	26	0.637	0.400	37.2%
120	B-95W	26	0.637	0.319	49.9%
121	B-95W	26	0.637	0.290	54.5%
122	B-96W	26	0.637	0.180	71.7%
123	B-96W	26	0.637	0.199	68.8%
124	B-96W	26	0.637	0.200	68.6%
125	B-96W	26	0.637	0.236	63.0%
126	B-96W	26	0.637	0.300	52.9%
127	B-96W	26	0.637	0.301	52.7%
128	B-97W	26	0.637	0.315	50.5%
129	B-97W	26	0.637	0.267	58.1%
130	B-97W	26	0.637	0.311	51.2%
131	B-97W	26	0.637	0.300	52.9%
132	B-97W	26	0.637	0.245	61.5%
133	B-97W	26	0.637	0.319	49.9%
134	B-97W	26	0.637	0.300	52.9%
135	B-98V	26	0.637	0.378	40.7%
136	B-98V	26	0.637	0.328	48.5%
137	B-98V	26	0.637	0.345	45.8%
138	B-98V	26	0.637	0.276	56.7%
139	B-98V	26	0.637	0.234	63.3%
140	B-98V	26	0.637	0.219	65.6%
141	B-99V	26	0.637	0.199	68.8%
142	B-99V	26	0.637	0.150	76.5%
143	B-99V	26	0.637	0.256	59.8%
144	B-99V	26	0.637	0.309	51.5%
145	B-99V	26	0.637	0.345	45.8%
146	B-99V	26	0.637	0.189	70.3%

22.3 COMPARTMENT C



Annotation of Bottom Shell and Keel Plating, Longitudinal and Transverse Members for UT Readings in Compartment C Tankage

Compartment C Tankage - Ultrasonic Testing Readings of Transverse Members

Transverse Member Notation	Compartment Division	Original Weight (lbs)	Original Thickness (in)	Measured Thickness (in)	Percentage Wastage
T1	C-90F	15	0.368	0.225	38.9%
T2	C-90F	15	0.368	0.199	45.9%
T3	C-90F	15	0.368	0.192	47.8%
T4	C-91F	15	0.368	0.233	36.7%
T5	C-90F	15	0.368	0.222	39.7%
T6	C-91F	15	0.368	0.200	45.7%
T7	C-91F	15	0.368	0.190	48.4%
T8	C-92F	12	0.368	0.165	55.2%
T9	C-93F	15	0.368	0.234	36.4%
T10	C-92F	15	0.368	0.199	45.9%
T11	C-92F	15	0.368	0.205	44.3%
T12	C-92F	15	0.368	0.158	57.1%
T13	C-93F	15	0.368	0.251	31.8%
T14	C-93F	15	0.368	0.187	49.2%
T15	C-93F	15	0.368	0.224	39.1%
T16	C-94F	12	0.294	0.128	56.5%
T17	C-94F	12	0.294	0.175	40.5%
T18	C-94F	12	0.294	0.168	42.9%
T19	C-94F	12	0.294	0.190	35.4%
T20	C-96F	12	0.294	0.229	22.1%
T21	C-96F	12	0.294	0.179	39.1%
T22	C-96F	12	0.294	0.160	45.6%
T23	C-96F	12	0.294	0.237	19.4%
T24	C-98F	12	0.294	0.200	32.0%
T25	C-98F	12	0.294	0.178	39.5%
T26	C-99F	12	0.294	0.150	49.0%
T27	C-99F	12	0.294	0.198	32.7%
T28	C-98F	12	0.294	0.211	28.2%
T29	C-99F	12	0.294	0.205	30.3%
T30	C-98F	12	0.294	0.145	50.7%
T31	C-99F	12	0.294	0.199	32.3%

Compartment C Tankage - Ultrasonic Testing Readings of Longitudinal Members

Longitudinal Member Notation	Compartment Division	Original Weight (lbs)	Original Thickness (in)	Measured Thickness (in)	Percentage Wastage
L1	C-90F	20	0.490	0.360	26.5%
L2	C-90F	20	0.490	0.259	47.1%
L3	C-90F	20	0.490	0.390	20.4%
L4	C-90F	20	0.490	0.325	33.7%
L5	C-90F	20	0.490	0.345	29.6%
L6	C-91F	20	0.490	0.279	43.1%
L7	C-91F	20	0.490	0.257	47.6%
L8	C-91F	20	0.490	0.300	38.8%
L9	C-90F	20	0.490	0.185	62.2%
L10	C-91F	20	0.490	0.159	67.6%
L11	C-91F	20	0.490	0.267	45.5%
L12	C-90F	20	0.490	0.283	42.2%
L13	C-91F	20	0.490	0.234	52.2%
L14	C-92F	20	0.490	0.210	57.1%
L15	C-93F	20	0.490	0.300	38.8%
L16	C-92F	20	0.490	0.305	37.8%
L17	C-93F	20	0.490	0.267	45.5%
L18	C-93F	20	0.490	0.320	34.7%
L19	C-92F	20	0.490	0.303	38.2%
L20	C-92F	20	0.490	0.256	47.8%
L21	C-92F	20	0.490	0.234	52.2%
L22	C-93F	20	0.490	0.241	50.8%
L23	C-93F	20	0.490	0.278	43.3%
L24	C-93F	20	0.490	0.309	36.9%
L25	C-93F	20	0.490	0.312	36.3%
L26	C-94F	20	0.490	0.323	34.1%
L27	C-94F	20	0.490	0.300	38.8%
L28	C-94F	20	0.490	0.245	50.0%
L29	C-94F	20	0.490	0.284	42.0%
L30	C-94F	20	0.490	0.276	43.7%
L31	C-94F	20	0.490	0.289	41.0%
L32	C-96F	20	0.490	0.299	39.0%
L33	C-96F	20	0.490	0.310	36.7%
L34	C-96F	20	0.490	0.300	38.8%
L35	C-96F	20	0.490	0.305	37.8%
L36	C-96F	17 1/2	0.429	0.300	30.1%
L37	C-96F	17 1/2	0.429	0.296	31.0%
L38	C-98F	17 1/2	0.429	0.278	35.2%
L39	C-98F	17 1/2	0.429	0.255	40.6%
L40	C-98F	17 1/2	0.429	0.254	40.8%
L41	C-98F	17 1/2	0.429	0.223	48.0%
L42	C-99F	17 1/2	0.429	0.210	51.0%
L43	C-99F	17 1/2	0.429	0.320	25.4%
L44	C-98F	17 1/2	0.429	0.287	33.1%
L45	C-99F	17 1/2	0.429	0.300	30.1%

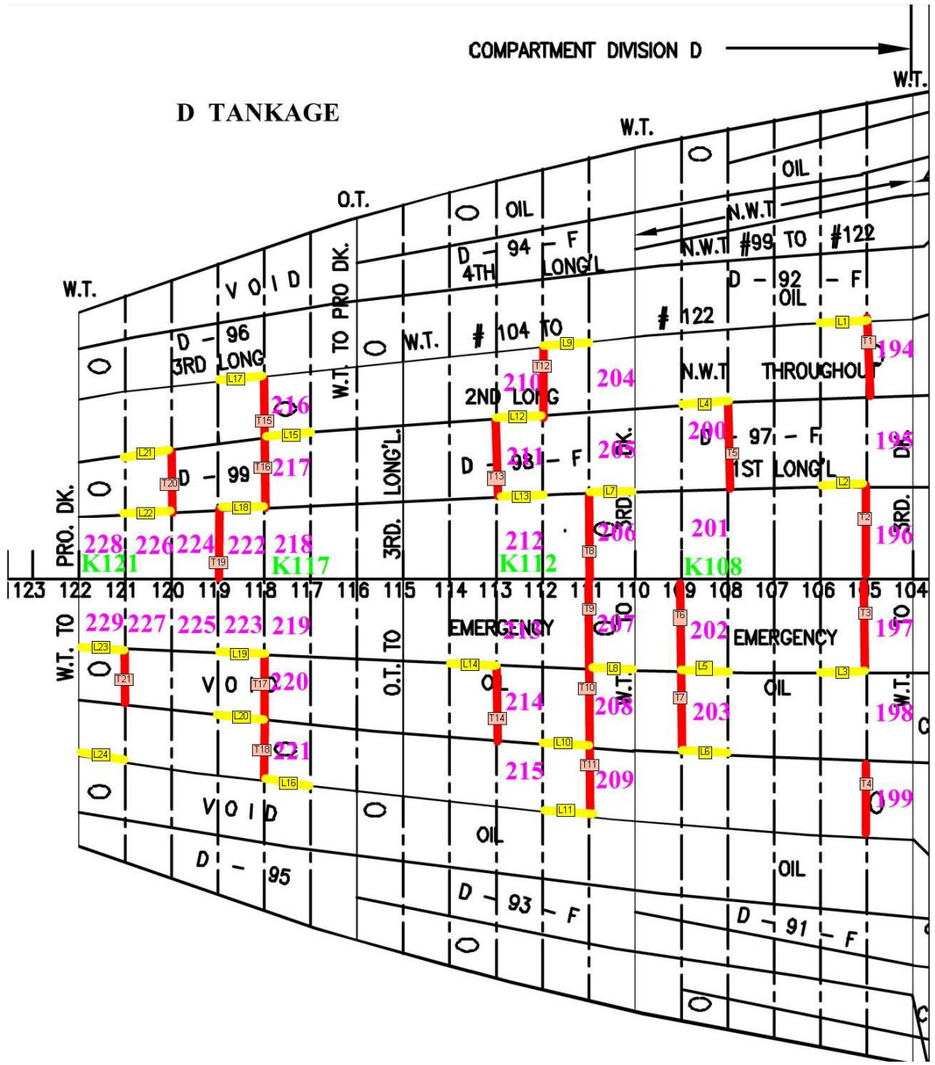
Compartment C Tankage - Ultrasonic Testing Readings of Bottom Shell Plating

Shell Plate Notation	Compartment Division	Original Weight (lbs)	Original Thickness (in)	Measured Thickness (in)	Percentage Wastage
147	C-90F	26	0.637	0.167	73.8%
148	C-90F	26	0.637	0.185	71.0%
149	C-90F	26	0.637	0.333	47.7%
150	C-90F	26	0.637	0.374	41.3%
151	C-90F	26	0.637	0.367	42.4%
152	C-90F	26	0.637	0.429	32.7%
153	C-90F	26	0.637	0.500	21.5%
154	C-91F	26	0.637	0.452	29.0%
155	C-91F	26	0.637	0.389	38.9%
156	C-91F	26	0.637	0.410	35.6%
157	C-91F	26	0.637	0.345	45.8%
158	C-91F	26	0.637	0.329	48.4%
159	C-91F	26	0.637	0.333	47.7%
160	C-92F	26	0.637	0.412	35.3%
161	C-92F	26	0.637	0.357	44.0%
162	C-92F	26	0.637	0.323	49.3%
163	C-92F	26	0.637	0.300	52.9%
164	C-92F	26	0.637	0.223	65.0%
165	C-93F	26	0.637	0.212	66.7%
166	C-93F	26	0.637	0.199	68.8%
167	C-93F	26	0.637	0.165	74.1%
168	C-93F	26	0.637	0.150	76.5%
169	C-93F	26	0.637	0.199	68.8%
170	C-94F	26	0.637	0.234	63.3%
171	C-94F	26	0.637	0.115	81.9%
172	C-94F	26	0.637	0.210	67.0%
173	C-94F	24	0.588	0.188	68.0%
174	C-94F	24	0.588	0.209	64.5%
175	C-96F	24	0.588	0.179	69.6%
176	C-96F	24	0.588	0.289	50.9%
177	C-96F	24	0.588	0.303	48.5%
178	C-96F	24	0.588	0.300	49.0%
179	C-96F	24	0.588	0.311	47.1%
180	C-98F	22 1/2	0.551	0.345	37.4%
181	C-98F	22 1/2	0.551	0.298	45.9%
182	C-98F	22 1/2	0.551	0.275	50.1%
183	C-98F	22 1/2	0.551	0.222	59.7%
184	C-98F	22 1/2	0.551	0.343	37.7%
185	C-98F	22 1/2	0.551	0.290	47.4%
186	C-99F	22 1/2	0.551	0.200	63.7%
187	C-99F	22 1/2	0.551	0.195	64.6%
188	C-99F	22 1/2	0.551	0.189	65.7%
189	C-99F	22 1/2	0.551	0.235	57.4%
190	C-99F	22 1/2	0.551	0.300	45.6%
191	C-99F	22 1/2	0.551	0.311	43.6%
192	C-99F	22 1/2	0.551	0.263	52.3%
193	C-99F	22 1/2	0.551	0.290	47.4%

Compartment C Tankage - Ultrasonic Testing Readings of Keel Plating

Keel Plate Notation	Original Weight (lbs)	Original Thickness (in)	Measured Thickness (in)	Percentage Wastage
K83	30	0.735	0.305	58.5%
K88	30	0.735	0.400	45.6%
K90	30	0.735	0.300	59.2%
K93	30	0.735	0.295	59.9%
K96	30	0.735	0.226	69.3%
K102	30	0.735	0.424	42.3%

22.4 COMPARTMENT D



Annotation of Bottom Shell and Keel Plating, Longitudinal and Transverse Members for UT Readings in Compartment D Tankage

Compartment D Tankage - Ultrasonic Testing Readings of Transverse Members

Transverse Member Notation	Compartment Division	Original Weight (lbs)	Original Thickness (in)	Measured Thickness (in)	Percentage Wastage
T1	D-97F	12	0.294	0.221	24.8%
T2	D-97F	12	0.294	0.187	36.4%
T3	D-97F	12	0.294	0.192	34.7%
T4	D-97F	12	0.294	0.202	31.3%
T5	D-97F	12	0.294	0.188	36.1%
T6	D-97F	12	0.294	0.225	23.5%
T7	D-98F	12	0.294	0.190	35.4%
T8	D-98F	12	0.294	0.202	31.3%
T9	D-98F	12	0.294	0.233	20.7%
T10	D-98F	12	0.294	0.185	37.1%
T11	D-98F	12	0.294	0.145	50.7%
T12	D-98F	12	0.294	0.160	45.6%
T13	D-98F	12	0.294	0.155	47.3%
T14	D-98F	12	0.294	0.222	24.5%
T15	D-99F	12	0.294	0.219	25.5%
T16	D-99F	12	0.294	0.200	32.0%
T17	D-99F	12	0.294	0.165	43.9%
T18	D-99F	12	0.294	0.130	55.8%
T19	D-99F	12	0.294	0.121	58.8%
T20	D-99F	12	0.294	0.200	32.0%
T21	D-99F	12	0.294	0.209	28.9%

Compartment D Tankage - Ultrasonic Testing Readings of Longitudinal Members

Longitudinal Member Notation	Compartment Division	Original Weight (lbs)	Original Thickness (in)	Measured Thickness (in)	Percentage Wastage
L1	D-97F	17 1/2	0.429	0.300	30.1%
L2	D-97F	17 1/2	0.429	0.259	39.6%
L3	D-97F	17 1/2	0.429	0.300	30.1%
L4	D-97F	17 1/2	0.429	0.315	26.6%
L5	D-97F	17 1/2	0.429	0.249	42.0%
L6	D-97F	17 1/2	0.429	0.276	35.7%
L7	D-98F	17 1/2	0.429	0.255	40.6%
L8	D-98F	17 1/2	0.429	0.300	30.1%
L9	D-98F	17 1/2	0.429	0.291	32.2%
L10	D-98F	17 1/2	0.429	0.211	50.8%
L11	D-98F	17 1/2	0.429	0.189	55.9%
L12	D-98F	17 1/2	0.429	0.155	63.9%
L13	D-98F	17 1/2	0.429	0.200	53.4%
L14	D-98F	17 1/2	0.429	0.231	46.2%
L15	D-99F	17 1/2	0.429	0.249	42.0%
L16	D-99F	17 1/2	0.429	0.300	30.1%
L17	D-99F	17 1/2	0.429	0.275	35.9%
L18	D-99F	17 1/2	0.429	0.294	31.5%
L19	D-99F	17 1/2	0.429	0.304	29.1%
L20	D-99F	17 1/2	0.429	0.311	27.5%
L21	D-99F	17 1/2	0.429	0.271	36.8%
L22	D-99F	17 1/2	0.429	0.246	42.7%
L23	D-99F	17 1/2	0.429	0.255	40.6%
L24	D-99F	17 1/2	0.429	0.249	42.0%

Compartment D Tankage - Ultrasonic Testing Readings of Bottom Shell Plating

Shell Plate Notation	Compartment Division	Original Weight (lbs)	Original Thickness (in)	Measured Thickness (in)	Percentage Wastage
194	D-97F	12	0.294	0.225	23.5%
195	D-97F	12	0.294	0.200	32.0%
196	D-97F	12	0.294	0.199	32.3%
197	D-97F	12	0.294	0.267	9.2%
198	D-97F	12	0.294	0.211	28.2%
199	D-97F	12	0.294	0.267	9.2%
200	D-97F	12	0.294	0.239	18.7%
201	D-97F	12	0.294	0.221	24.8%
202	D-97F	12	0.294	0.278	5.4%
203	D-97F	12	0.294	0.233	20.7%
204	D-98F	12	0.294	0.229	22.1%
205	D-98F	12	0.294	0.187	36.4%
206	D-98F	12	0.294	0.215	26.9%
207	D-98F	12	0.294	0.191	35.0%
208	D-98F	12	0.294	0.228	22.4%
209	D-98F	12	0.294	0.237	19.4%
210	D-98F	12	0.294	0.222	24.5%
211	D-98F	12	0.294	0.238	19.0%
212	D-98F	12	0.294	0.197	33.0%
213	D-98F	12	0.294	0.155	47.3%
214	D-98F	12	0.294	0.243	17.3%
215	D-98F	12	0.294	0.229	22.1%
216	D-99F	12	0.294	0.198	32.7%
217	D-99F	12	0.294	0.184	37.4%
218	D-99F	12	0.294	0.289	1.7%
219	D-99F	12	0.294	0.300	-2.0%
220	D-99F	12	0.294	0.251	14.6%
221	D-99F	12	0.294	0.221	24.8%
222	D-99F	12	0.294	0.169	42.5%
223	D-99F	12	0.294	0.202	31.3%
224	D-99F	12	0.294	0.231	21.4%
225	D-99F	12	0.294	0.150	49.0%
226	D-99F	12	0.294	0.161	45.2%
227	D-99F	12	0.294	0.151	48.6%
228	D-99F	12	0.294	0.098	66.7%
229	D-99F	12	0.294	0.234	20.4%

Compartment D Tankage - Ultrasonic Testing Readings of Keel Plating

Keel Plate Notation	Original Weight (lbs)	Original Thickness (in)	Measured Thickness (in)	Percentage Wastage
K108	30	0.735	0.290	60.5%
K112	30	0.735	0.200	72.8%
K117	30	0.735	0.245	66.7%
K121	30	0.735	0.200	72.8%

23 APPENDIX C (Coating System Specifications)

International

Intershield 300V

Abrasion Resistant Aluminium Pure Epoxy

PRODUCT DESCRIPTION

A <340g/l VOC light colored, abrasion resistant, aluminium pure epoxy coating giving excellent long term anticorrosive protection and low temperature application capability.

INTENDED USES

A universal primer which can be applied directly to mechanically prepared shop primer or suitably prepared bare steel. Suitable for use with controlled cathodic protection. A tank coating which is approved for the carriage of potable water.
For use at Newbuilding or Maintenance & Repair.

NSF

Certified to ANSI/NSF Standard 61.
NSF Certification is for tanks greater than 5,000 gallons

PRODUCT INFORMATION

Color	ENA310-Bronze, ENA311-Aluminium
Finish/Sheen	Matt
Part B (Curing Agent)	ENA313
Volume Solids	63% ±2% (ISO 3233:1998)
Mix Ratio	1.00 volume(s) Part A to 1 volume(s) Part B
Typical Film Thickness	6 mils dry (9.5 mils wet)
Theoretical Coverage	168 ft²/US gal at 6 mils dft, allow appropriate loss factors
Method of Application	Airless Spray, Brush, Roller
Flash Point	Part A 106°F; Part B 79°F; Mixed 88°F
Induction Period	Not required

Drying Information	23°F	41°F	77°F	95°F
Touch Dry (ISO 9117/3:2010)	6 hrs	4 hrs	3 hrs	60 mins
Hard Dry (ISO 9117-1:2009)	28 hrs	17 hrs	4 hrs	2 hrs
Pot Life	6 hrs	6 hrs	2 hrs	60 mins

Overcoating Data - see limitations

	Substrate Temperature							
	23°F		41°F		77°F		95°F	
Overcoated By	Min	Max	Min	Max	Min	Max	Min	Max
Interfine 979	30 hrs	5 days	18 hrs	5 days	6.5 hrs	3 days	4 hrs	3 days
Intergard 267	30 hrs	14 days	18 hrs	14 days	6.5 hrs	14 days	4 hrs	14 days
Intergard 268	30 hrs	7 days	18 hrs	7 days	6.5 hrs	7 days	4 hrs	7 days
Intergard 740	30 hrs	7 days	18 hrs	7 days	6.5 hrs	7 days	4 hrs	7 days
Intergard 755	30 hrs	3 days	18 hrs	3 days	6.5 hrs	3 days	4 hrs	3 days
Intershield 300V Immersed Areas	30 hrs	14 days	18 hrs	14 days	6.5 hrs	14 days	4 hrs	14 days
Intershield 300V Non Immersed Areas	30 hrs	6 mths	18 hrs	6 mths	6.5 hrs	5.5 mths	4 hrs	3 mths
Interthane 990	30 hrs	3 days	18 hrs	3 days	6.5 hrs	3 days	4 hrs	3 days
Interthane 990HS	30 hrs	3 days	18 hrs	3 days	6.5 hrs	3 days	4 hrs	3 days
Intershield 6GV	30 hrs	3 days	18 hrs	3 days	6.5 hrs	3 days	4 hrs	3 days

Note For Intergard 755, Intergard 740, Interthane 990 and Interthane 990HS a minimum temperature of 41°F is required to achieve full cure and specified performance.

REGULATORY DATA

VOC	326 g/lt (2.72 lb/US gal) as supplied (EPA Method 24)

Note: VOC values are typical and are provided for guidance purposes only. These may be subject to variation depending on factors such as differences in color and normal manufacturing tolerances.

International.

Intershield 300V

Abrasion Resistant Aluminium Pure Epoxy

CERTIFICATION

When used as part of an approved scheme, this product has the following certification:

- Food Contact - Carriage of Grain (NOHA)
- Tank Coatings - B1 Classification of Ballast Tank Coatings (DNV/Marintek tested)
- Fire Resistance - Marine Equipment Directive compliant
- Potable Water - Certification for tanks greater than 5,000 gallons (ANSI Standard 61)

Potable Water Certification issued by external bodies is dependent upon formulation and/or manufacturing site. Based on this, products supplied in different territories may not be approved to all of the standards listed above. Consult your International Paint representative for details.

SYSTEMS AND COMPATIBILITY

Consult your International Paint representative for the system best suited for the surfaces to be protected.
If overcoating Intershield 300V with antifoulings or single pack finishes, the first coat of material must be applied while the Intershield 300V is soft to thumbprint or slightly tacky.
When using in cargo holds, consult the Intershield 300V Cargo Hold Application Procedures.
For tank coating, consult International Paint for the detailed coating procedures that should be followed.

SURFACE PREPARATIONS

Use in accordance with the standard Worldwide Marine Specifications.
All surfaces to be coated should be clean, dry and free from contamination.
High pressure fresh water wash or fresh water wash, as appropriate, and remove all oil or grease, soluble contaminants and other foreign matter in accordance with SSPC-SP1 solvent cleaning.

NEWBUILDING

Where necessary, remove weld spatter and smooth weld seams and sharp edges.
Weld seams and areas of shop primer damage or breakdown should be blast cleaned to Sa2½ (ISO 8501-1:2007) or power tooled to Pt3 (JSRA SPSS:1984).
Intact, approved, shop primers must be clean, dry and free from soluble salts and any other surface contaminants. Unapproved shop primers will require complete removal by blast cleaning to Sa2½ (ISO 8501-1:2007). In some cases sweep blasting to a defined International Paint standard (eg AS2 or AS3) may be acceptable. Consult your International Paint representative for specific recommendations.

MAJOR REFURBISHMENT

Abrasive blast clean to minimum Sa2 (ISO 8501-1:2007) or International Paint Hydroblasting Standard HB2M. If oxidation has occurred between blasting and application of Intershield 300V, the surface should be reblasted to the specified visual standard.
Surface defects revealed by the blast cleaning process, should be ground, filled, or treated in the appropriate manner.

REPAIR

Consult International Paint.

Consult your International Paint representative for specific recommendations.

When full abrasive blasting is carried out, a sharp angular surface profile of 2-4 mils is recommended.

NOTE

For use in Marine situations in North America, the following surface preparation standards can be used:
SSPC-SP10 in place of Sa2½ (ISO 8501-1:2007)
SSPC-SP6 in place of Sa2 (ISO 8501-1:2007)
SSPC-SP11 in place of Pt3 (JSRA SPSS:1984)

International.

Intershield 300V

Abrasion Resistant Aluminium Pure Epoxy

APPLICATION

Mixing	Material is supplied in 2 containers as a unit. Always mix a complete unit in the proportions supplied. Once the unit has been mixed it must be used within the working pot life specified. (1) Agitate Base (Part A) with a power agitator. (2) Combine entire contents of Curing Agent (Part B) with Base (Part A) and mix thoroughly with power agitator.
Thinner	Use International GTA220 only in exceptional circumstances. DO NOT thin more than allowed by local environmental legislation.
Airless Spray	Recommended Tip Range 19-25 thou (0.48-0.64 mm) Total output fluid pressure at spray tip not less than 3000 psi (211 kg/cm²) - Pump Ratio 40:1 minimum
Brush	Application by brush is recommended for small areas only. Multiple coats may be required to achieve specified film thickness.
Roller	Application by roller is recommended for small areas only. Multiple coats may be required to achieve specified film thickness.
Cleaner	International GTA822/GTA415
Work Stoppages and Cleanup	Do not allow material to remain in hoses, gun or spray equipment. Thoroughly flush all equipment with International GTA822/GTA415. Once units of paint have been mixed they should not be resealed and it is advised that after prolonged stoppages work recommences with freshly mixed units. Clean all equipment immediately after use with International GTA822/GTA415. It is good working practice to periodically flush out spray equipment during the course of the working day. Frequency of cleaning will depend upon amount sprayed, temperature and elapsed time, including any delays. Do not exceed pot life limitations. All surplus materials and empty containers should be disposed of in accordance with appropriate regional regulations/legislation.
Welding	In the event welding or flame cutting is performed on metal coated with this product, dust and fumes will be emitted which will require the use of appropriate personal protective equipment and adequate local exhaust ventilation. In North America do so in accordance with instruction in ANSI/ASC Z49.1 "Safety in Welding and Cutting."

SAFETY

All work involving the application and use of this product should be performed in compliance with all relevant national Health, Safety & Environmental standards and regulations.

Prior to use, obtain, consult and follow the Material Safety Data Sheet for this product concerning health and safety information. Read and follow all precautionary notices on the Material Safety Data Sheet and container labels. If you do not fully understand these warnings and instructions or if you can not strictly comply with them, do not use this product. Proper ventilation and protective measures must be provided during application and drying to keep solvent vapor concentrations within safe limits and to protect against toxic or oxygen deficient hazards. Take precautions to avoid skin and eye contact (ie. gloves, goggles, face masks, barrier creams etc.) Actual safety measures are dependant on application methods and work environment.

EMERGENCY CONTACT NUMBERS:
USA/Canada - Medical Advisory Number 1-800-854-6813
Europe - Contact (44) 191 4696111. For advice to Doctors & Hospitals only contact (44) 207 6359191
R.O.W. - Contact Regional Office

International.

Intershield 300V

Abrasion Resistant Aluminium Pure Epoxy

LIMITATIONS

Intershield 300V should be high pressure fresh water washed and/or solvent washed prior to overcoating, where necessary, to ensure removal of any surface contamination that has accumulated.
Suitable for use on tanker decks subject to Classification Society Regulations.
Intershield 300V may be applied at substrate temperatures down to 23°F, however consideration should be given when overcoating at low temperatures as the remainder of the system may require higher temperatures to achieve full cure.
For North America: if overcoating Intershield 300V direct with antifoulings, the first coat of antifouling must be applied while the Intershield 300V is still tacky.
For use in potable water tank linings, as a two coat system with a 10 mils dft, nominal and cure of 30 days minimum at 77°F and 50% relative humidity.

Overcoating information is given for guidance only and is subject to regional variation depending upon local climate and environmental conditions. Consult your local International Paint representative for specific recommendations. Apply in good weather. Temperature of the surface to be coated must be at least 5°F above the dew point. For optimum application properties bring the material to 70°F-80°F, unless specifically instructed otherwise, prior to mixing and application. Unmixed material (in closed containers) should be maintained in protected storage in accordance with information given in the STORAGE Section of this data sheet. Technical and application data herein is for the purpose of establishing a general guideline of the coating application procedures. Test performance results were obtained in a controlled laboratory environment and International Paint makes no claim that the exhibited published test results, or any other tests, accurately represent results found in all field environments. As application, environmental and design factors can vary significantly, due care should be exercised in the selection, verification of performance and use of the coating.

UNIT SIZE

Unit Size	Part A		Part B	
	Vol	Pack	Vol	Pack
5 US gal	2.5 US gal	2.5 US gal	2.5 US gal	5 US gal

For availability of other unit sizes consult International Paint

UNIT SHIPPING WEIGHT

Unit Size	Unit Weight
5 US gal	59 lb

STORAGE

Shelf Life: 12 months minimum at 77°F. Subject to re-inspection thereafter. Store in dry, shaded conditions away from sources of heat and ignition.

WORLDWIDE AVAILABILITY Consult International Paint.

IMPORTANT NOTE

www.international-marine.com

International.

Interthane® 990

Polyurethane

PRODUCT DESCRIPTION

A two component acrylic polyurethane finish giving excellent durability and long term recoatability.

INTENDED USES

Suitable for use in both new construction and as a maintenance finish which can be used in a wide variety of environments including offshore structures, chemical and petrochemical plants, bridges, pulp and paper mills, and in the power industry.

PRACTICAL INFORMATION FOR INTERTHANE 990

Color	Wide range via the Chromascan® system
Gloss Level	High Gloss
Volume Solids	57% ± 3% (depends on color)
Typical Thickness	2-3 mils (50-75 microns) dry equivalent to 3.5-5.3 mils (88-132 microns) wet
Theoretical Coverage	457 sq.ft/US gallon at 2 mils d.f.t and stated volume solids 11.40 m²/liter at 50 microns d.f.t and stated volume solids
Practical Coverage	Allow appropriate loss factors
Method of Application	Airless Spray, Air Spray, Brush, Roller

Drying Time

			Overcoating Interval with recommended topcoats	
Temperature	**Touch Dry**	**Hard Dry**	*Minimum*	*Maximum*
41°F (5°C)	5 hours	24 hours	24 hours	Extended[1]
59°F (15°C)	150 minutes	10 hours	10 hours	Extended[1]
77°F (25°C)	90 minutes	6 hours	6 hours	Extended[1]
104°F (40°C)	60 minutes	3 hours	3 hours	Extended[1]

[1] See International Protective Coatings Definitions & Abbreviations

REGULATORY DATA

Flash Point	Part A 93°F (34°C); Part B 120°F (49°C); Mixed 95°F (35°C)	
Product Weight	10.1 lb/gal (1.21 kg/l)	
VOC	3.50 lb/gal (420 g/lt) 341 g/kg	EPA Method 24 EU Solvent Emissions Directive (Council Directive 1999/13/EC)

See Product Characteristics section for further details

International.

Interthane® 990

Polyurethane

SURFACE PREPARATION

All surfaces to be coated should be clean, dry and free from contamination. Prior to paint application, all surfaces should be assessed and treated in accordance with ISO 8504:2000.

Primed Surfaces

Interthane 990 should always be applied over a recommended anti-corrosive coating scheme. The primer surface should be dry and free from all contamination, and Interthane 990 must be applied within the overcoating intervals specified (consult the relevant product data sheet).

Areas of breakdown, damage etc., should be prepared to the specified standard (e.g. SSPC-SP6 or Sa2½ (ISO 8501 -1:2007), Abrasive Blasting, or SSPC-SP11, Power Tool Cleaning) and patch primed prior to the application of Interthane 990.

APPLICATION

Mixing

Material is supplied in two containers as a unit. Always mix a complete unit in the proportions supplied. Once the unit has been mixed, it must be used within the working pot life specified.

(1) Agitate Base (Part A) with a power agitator.
(2) Combine entire contents of Curing Agent (Part B) with Base (Part A) and mix thoroughly with power agitator.

Mix Ratio

6 part(s): 1part(s) by volume

Working Pot Life

41°F (5°C)	59°F (15°C)	77°F (25°C)	104°F (40°C)
12 hours	4 hours	2 hours	45 minutes

Airless Spray	Recommended	Tip Range 13-18 thou (0.33-0.45 mm) Total output fluid pressure at spray tip not less than 2204 psi (155 kg/cm²)
Air Spray (Pressure Pot)	Recommended	Gun: DeVilbiss MBC or JGA Air Cap: 704 or 765 Fluid Tip: E
Air Spray (Conventional)	Suitable	Use suitable proprietary equipment.
Brush	Suitable	Typically 1.6-2.0 mils (40-50 microns) can be achieved
Roller	Suitable	Typically 1.6-2.0 mils (40-50 microns) can be achieved
Thinner	International GTA713 (or International GTA733 or GTA056)	Do not thin more than allowed by local environmental legislation
Cleaner	International GTA713 (or International GTA733 or GTA056)	

Work Stoppages

Do not allow material to remain in hoses, gun or spray equipment. Thoroughly flush all equipment with International GTA056. Once units of paint have been mixed they should not be resealed and it is advised that after prolonged stoppages, work recommences with freshly mixed units.

Clean Up

Clean all equipment immediately after use with International GTA056. It is good working practice to periodically flush out spray equipment during the course of the working day. Frequency of cleaning will depend upon amount sprayed, temperature and elapsed time, including any delays.

All surplus materials and empty containers should be disposed of in accordance with appropriate regional regulations/legislation.

International.

Interthane® 990

Polyurethane

PRODUCT CHARACTERISTICS

Interthane 990 is available in a range of metallic finishes - please consult the separate Interthane 990 Metallic Working Procedures document for further information.

Level of sheen and surface finish is dependent on application method. Avoid using a mixture of application methods whenever possible.

Best results in terms of gloss and appearance will always be obtained by conventional air spray application.

For brush and roller application, and in some colors, two or more coats of Interthane 990 may be required to give uniform coverage, especially when applying Interthane 990 over dark undercoats, and when using certain lead free bright colors such as yellows and oranges. Best practice is to use a color compatible intermediate or anticorrosive coating under the Interthane 990.

When overcoating after weathering, or aging, ensure the coating is fully cleaned to remove all surface contamination such as oil, grease, salt crystals and traffic fumes, before application of a further coat of Interthane 990.

Absolute measured adhesion of topcoats to aged Interthane 990 is less than that to fresh material, however, it is adequate for the specified end use.

This product must only be thinned using the recommended International thinners. The use of alternative thinners, particularly those containing alcohols, can severely inhibit the curing mechanism of the coating.

Surface temperature must always be a minimum of 5°F (3°C) above dew point.

When applying Interthane 990 in confined spaces, ensure adequate ventilation.

Condensation occurring during or immediately after application may result in a matte finish and an inferior film.

Premature exposure to ponding water will cause color change, especially in dark colors and at low temperatures.

This product is not recommended for use in immersion conditions. When severe chemical or solvent splashing is likely to occur, contact International Protective Coatings for information regarding suitability.

A modified version of Interthane 990 is available for use within the Korean marketplace in order to provide improved workability.

Note: VOC values quoted are based on maximum possible for the product taking into account variations due to color differences and normal manufacturing tolerances.

Low molecular weight reactive additives, which will form part of the film during normal ambient cure conditions, will also effect VOC values determined using EPA Method 24.

SYSTEMS COMPATIBILITY

The following primers/intermediates are recommended for Interthane 990:

Intercure 200	Interseal 670HS
Intercure 200HS	Interzinc 315
Intercure 420	Interzinc 52
Intergard 251	Interzinc 52HS
Intergard 269	Interzone 505
Intergard 345	Interzone 954
Intergard 475HS	Interzone 1000

Interthane 990 is designed to be topcoated with itself.

For other suitable primers/intermediates, consult International Protective Coatings.

International.

Interthane® 990

Polyurethane

ADDITIONAL INFORMATION

Further information regarding industry standards, terms and abbreviations used in this data sheet can be found in the following documents available at www.international-pc.com:

- Definitions & Abbreviations
- Surface Preparation
- Paint Application
- Theoretical & Practical Coverage
- Interthane 990 Metallic Finish Working Procedures

Individual copies of these information sections are available upon request.

SAFETY PRECAUTIONS

This product is intended for use only by professional applicators in industrial situations in accordance with the advice given on this sheet, the Material Safety Data Sheet and the container(s), and should not be used without reference to the Material Safety Data Sheet (MSDS) which International Protective Coatings has provided to its customers.

All work involving the application and use of this product should be performed in compliance with all relevant national, Health, Safety & Environmental standards and regulations.

In the event welding or flame cutting is performed on metal coated with this product, dust and fumes will be emitted which will require the use of appropriate personal protective equipment and adequate local exhaust ventilation.

If in doubt regarding the suitability of use of this product, consult International Protective Coatings for further advice.

Warning: Contains isocyanate. Wear air-fed hood for spray application.

PACK SIZE

Unit Size	Part A Vol	Part A Pack	Part B Vol	Part B Pack
20 liter	17.14 liter	20 liter	2.86 liter	3.7 liter
5 US gal	4.29 US gal	5 US gal	0.71 US gal	1 US gal

For availability of other pack sizes contact International Protective Coatings

SHIPPING WEIGHT

Unit Size	Part A	Part B
20 liter	23.1 kg	3.5 kg
5 US gal	47.6 lb	7.1 lb

STORAGE

Shelf Life: 24 months (Part A) & 12 months (Part B) minimum at 77°F (25°C)
Subject to re-inspection thereafter. Store in dry, shaded conditions away from sources of heat and ignition.

Disclaimer

The information in this data sheet is not intended to be exhaustive; any person using the product for any purpose other than that specifically recommended in this data sheet without first obtaining written confirmation from us as to the suitability of the product for the intended purpose does so at their own risk. All advice given or statements made about the product (whether in this data sheet or otherwise) is correct to the best of our knowledge but we have no control over the quality or the condition of the substrate or the many factors affecting the use and application of the product. ***THEREFORE, UNLESS WE SPECIFICALLY AGREE IN WRITING TO DO SO, WE DO NOT ACCEPT ANY LIABILITY AT ALL FOR THE PERFORMANCE OF THE PRODUCT OR FOR (SUBJECT TO THE MAXIMUM EXTENT PERMITTED BY LAW) ANY LOSS OR DAMAGE ARISING OUT OF THE USE OF THE PRODUCT. WE HEREBY DISCLAIM ANY WARRANTIES OR REPRESENTATIONS, EXPRESS OR IMPLIED, BY OPERATION OF LAW OR OTHERWISE, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.*** *All products supplied and technical advice given are subject to our Conditions of Sale. You should request a copy of this document and review it carefully. The information contained in this data sheet is liable to modification from time to time in the light of experience and our policy of continuous development. It is the user's responsibility to check with their local International Paint representative that this data sheet is current prior to using the product.*

International

Interfine 979

Polysiloxane Finish

PRODUCT DESCRIPTION

A patented high performance, high volume solids content acrylic polysiloxane cosmetic finish providing excellent long term durability. Interfine 979 significantly improves upon the gloss and color retention exhibited by typical polyurethane finishes.

INTENDED USES

As a cosmetic finish on above water areas.
For use at Newbuilding and Major Refurbishment.

PRODUCT INFORMATION

Color	SYB000-White ; and a range of colors
Finish/Sheen	Gloss
Part B (Curing Agent)	SYA056 (use SYA076 in EMEA)
Volume Solids	76% (ISO 3233:1998)
Mix Ratio	4.00 volume(s) Part A to 1 volume(s) Part B
Typical Film Thickness	5 mils dry (6.6 mils wet)
Theoretical Coverage	244 ft²/US gal at 5 mils dft, allow appropriate loss factors
Method of Application	Airless Spray, Air Spray
Flash Point	Part A 90°F; Part B 131°F; Mixed 95°F

Drying Information	41°F	50°F	77°F	95°F
Touch Dry [ISO 1517:73]	6 hrs	5 hrs	3 hrs	2 hrs
Hard Dry [ISO 9117:90]	8 hrs	6.5 hrs	4 hrs	3 hrs
Pot Life	3.5 hrs	3 hrs	2 hrs	1.5 hrs

Overcoating Data - see limitations

	Substrate Temperature							
	41°F		50°F		77°F		95°F	
Overcoated By	Min	Max	Min	Max	Min	Max	Min	Max
Interfine 979	8 hrs	ext	6.5 hrs	ext	4 hrs	ext	3 hrs	ext

REGULATORY DATA

VOC

218 g/lt (1.82 lb/US gal) as supplied (EPA Method 24)
162 g/kg of liquid paint as supplied. EU Solvent Emissions Directive (Council Directive 1999/13/EC)

Note: VOC values are typical and are provided for guidance purposes only. These may be subject to variation depending on factors such as differences in color and normal manufacturing tolerances.

International.

Interfine 979

Polysiloxane Finish

CERTIFICATION

When used as part of an approved scheme, this material has the following certification:

- Fire Resistance - Marine Equipment Directive compliant
- Fire Resistance - Surface Spread of Flame (WFR) - (IMO Resolution A653 (16))
- Fire Resistance - MSC61(67) Smoke & Toxicity (WFR)
- Fire Resistance - Surface Spread of Flame (WFR) - (BS476:Part 7)
- Fire retardant: Naval Engineering Standard 711.
- Fire retardant: Naval Engineering Standard 713

Consult your International Paint representative for details.

SYSTEMS AND COMPATIBILITY

For use on Marine projects, Interfine 979 may only be applied over Intergard 264, Intershield 300 and Intershield 300V.
Alternative primers may be used, depending upon region. Consult International Paint.
Consult your International Paint representative for the system best suited for the surfaces to be protected.

SURFACE PREPARATIONS

Use in accordance with the standard Worldwide Marine Specifications.
All surfaces to be coated should be clean, dry and free from contamination.
High pressure fresh water wash or fresh water wash, as appropriate, and remove all oil or grease, soluble contaminants and other foreign matter in accordance with SSPC-SP1 solvent cleaning.

NEWBUILDING/MAJOR REFURBISHMENT

Interfine 979 should always be applied over a recommended primer coating scheme. The primer surface should be dry and free from all contamination, and Interfine 979 must be applied within the overcoating intervals specified (consult the relevant product data sheet).Areas of breakdown, damage etc., should be prepared to the specified standard (e.g. Sa2½ (ISO 8501-1:2007) and primed prior to the application of Interfine 979

Consult your International Paint representative for specific recommendations.

NOTE

For use in Marine situations in North America, the following surface preparation standards can be used: SSPC-SP10 in place of Sa2½ (ISO 8501-1:2007)

International

Interfine 979

Polysiloxane Finish

APPLICATION

Mixing	Material is supplied in 2 containers as a unit. Always mix a complete unit in the proportions supplied. Once the unit has been mixed it must be used within the working pot life specified. (1) Agitate Base (Part A) with a power agitator. (2) Combine entire contents of Curing Agent (Part B) with Base (Part A) and mix thoroughly with power agitator. After mixing Part A and Part B a slight exotherm may be noted, which is typical of this product, and is a result of chemical reaction.
Thinner	International GTA007. Do not thin more than allowed by local environmental legislation.
Airless Spray	Recommended Tip Range 11-21 thou (0.28-0.53 mm) Total output fluid pressure at spray tip not less than 2200 psi (155 kg/cm²)
Conventional Spray	Recommended. Gun DeVilbiss MCB or JGA Air Cap 704 or 765 Fluid Tip E
Brush	Application by brush is recommended for small areas only. Multiple coats may be required to achieve specified film thickness.
Roller	Application by roller is recommended for small areas only. Multiple coats may be required to achieve specified film thickness.
Cleaner	International GTA007
Work Stoppages and Cleanup	Do not allow material to remain in hoses, gun or spray equipment. Thoroughly flush all equipment with International GTA007. Once units of paint have been mixed they should not be resealed and it is advised that after prolonged stoppages work recommences with freshly mixed units. Clean all equipment immediately after use with International GTA007. It is good working practice to periodically flush out spray equipment during the course of the working day. Frequency of cleaning will depend upon amount sprayed, temperature and elapsed time, including any delays. Do not exceed pot life limitations. All surplus materials and empty containers should be disposed of in accordance with appropriate regional regulations/legislation.
Welding	In the event welding or flame cutting is performed on metal coated with this product, dust and fumes will be emitted which will require the use of appropriate personal protective equipment and adequate local exhaust ventilation. In North America do so in accordance with instruction in ANSI/ASC Z49.1 "Safety in Welding and Cutting."

SAFETY

All work involving the application and use of this product should be performed in compliance with all relevant national Health, Safety & Environmental standards and regulations.

Prior to use, obtain, consult and follow the Material Safety Data Sheet for this product concerning health and safety information. Read and follow all precautionary notices on the Material Safety Data Sheet and container labels. If you do not fully understand these warnings and instructions or if you can not strictly comply with them, do not use this product. Proper ventilation and protective measures must be provided during application and drying to keep solvent vapor concentrations within safe limits and to protect against toxic or oxygen deficient hazards. Take precautions to avoid skin and eye contact (ie. gloves, goggles, face masks, barrier creams etc.) Actual safety measures are dependant on application methods and work environment.

EMERGENCY CONTACT NUMBERS:

USA/Canada - Medical Advisory Number 1-800-854-6813

Europe - Contact (44) 191 4696111. For advice to Doctors & Hospitals only contact (44) 207 6359191

R.O.W. - Contact Regional Office

International.

Interfine 979

Polysiloxane Finish

LIMITATIONS

Overcoating information is given for guidance only and is subject to regional variation depending upon local climate and environmental conditions. Consult your local International Paint representative for specific recommendations. The optimum curing conditions for Interfine 979 are between 40% and 85%, curing times may vary outside these parameters.

Apply in good weather. Temperature of the surface to be coated must be at least 5°F above the dew point. For optimum application properties bring the material to 70°F-81°F, unless specifically instructed otherwise, prior to mixing and application. Unmixed material (in closed containers) should be maintained in protected storage in accordance with information given in the STORAGE Section of this data sheet. Technical and application data herein is for the purpose of establishing a general guideline of the coating application procedures. Test performance results were obtained in a controlled laboratory environment and International Paint makes no claim that the exhibited published test results, or any other tests, accurately represent results found in all field environments. As application, environmental and design factors can vary significantly, due care should be exercised in the selection, verification of performance and use of the coating.
In the overcoating data section 'ext' = extended overcoating period. Please refer to our Marine Painting Guide - Definitions and Abbreviations available on our website.

UNIT SIZE

Unit Size	Part A		Part B	
	Vol	Pack	Vol	Pack
20 lt	16 lt	20 lt	4 lt	5 lt
5 US gal	4 US gal	5 US gal	1 US gal	1 US gal

For availability of other unit sizes consult International Paint

UNIT SHIPPING WEIGHT

Unit Size	Unit Weight
20 lt	28.7 Kg
5 US gal	58.5 lb

STORAGE

Shelf Life: Part A - 12 months minimum at 77°F.
Part B - 6 months maximum at 77°F.
Subject to reinspection thereafter. Store in dry, shaded conditions away from sources of heat and ignition.

WORLDWIDE AVAILABILITY Consult International Paint.

IMPORTANT NOTE

www.international-marine.com

24 APPENDIX D (Glossary)

Athwartships: Across a ship from side to side.

Bitt: One of a pair of strong posts on the deck of a ship for securing mooring and other lines

Bulkhead: A bulkhead is an upright wall within the hull of a ship

Camber: A measure of transversal deck curvature in naval architecture

Chock: A heavy fitting of metal or wood with two jaws curving inward, through which a rope or cable may be run.

Gunwale: The gunwale (pronounced “gunnel" to rhyme with "tunnel") is a nautical term describing the top edge of the side of a boat.

Hawse: The space between the bows and anchors of a ship. The arrangement of a ship's anchor and chain when both starboard and port anchors are secured.

Keel: A fore-and-aft structural member in the bottom of a hull, extending from the stem to the sternpost and having the floors or frames attached to it, usually at right angles: sometimes projecting from the bottom of the hull to provide stability.

Keelson: Any of various fore-and-aft structural members lying above or parallel to the keel in the bottom of a hull.

Longitudinal Frame: Any of the frames of a ship running fore and aft.

Scantling: In shipbuilding, the scantling refers to the collective dimensions of the various parts, particularly the framing and structural supports. The word is most often used in the plural to describe how much structural strength in the form of girders, I-beams, etc. is in a given section.

Stanchion: Vertical support for chains or ropes, as in marine applications (lifelines on yachts are supported by stanchions).

Strake: A single continuous line of metal plating extending on a vessel's hull from stem to stern.

Transverse Frame: A ship frame consisting of a large number of relatively small, closely spaced, athwartship frames, reinforced in the bottom by vertical floor plates and working in conjunction with widely spaced, fore-and-aft, deep girders, such as the keel, longitudinals, and side stringers.

Tumblehome: The inward curve of a ship's topsides.

Web Frame: A deep transverse frame reinforcing the hull of a ship.